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THE INDICATIONS AND PROGNOSIS IN UNILATERAL NEPHRECTOMY

CHAIRMAN'S ADDRESS

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There is no procedure which should be approached with more careful deliberation on the part of the surgeon than the operation for removal of a kidney.

Aside from the occasional emergencies of traumatic rupture, unilateral massive hemorrhage or fulminating infection, the operation is a relatively elective one on the part of both patient and surgeon. Fortunately, modern diagnostic procedures, properly applied and evaluated, usually leave little doubt as to the cause of unilateral renal disease and in the indications for removing the affected kidney. Not infrequently lesions exist in both kidneys, and the less affected one can be satisfactorily restored to normal function by manipulative or surgical means prior to the removal of the one which is hopelessly destroyed.

The removal of a kidney can be satisfactorily accomplished by any surgeon with the necessary skill and technical experience, but the indications that prompt the procedure must be based on the results of an accurate and complete urologic investigation which not only surveys the condition of the entire urinary tract but also demonstrates that no surgical procedure short of nephrectomy is sufficient to rectify the condition.

In the last twenty years, largely through the specialized attention of urologists, great strides have been made toward conservative renal surgery. Partial resection of the kidney, plastic operations on the renal pelvis and the ureters, nephrolysis and ureterolysis combined with nephropexy, and progressive dilation of ureteral strictures through the cystoscope have made nephrectomy a far less frequent operative procedure than in the previous decade. It is often a matter of fine judgment on the part of the surgeon at the time of operation as to whether the kidney should best be removed or less radical measures adopted in the hope that function and health may be restored. The necessity for secondary nephrectomy at a later date occasionally refutes what had seemed good conservative policy at the first operation.

Nephrectomy is a more recent operation than many of the commonly practiced surgical procedures. Inadvertent nephrectomy was first successfully performed by Wolcott in America in 1861. Dr. Gustave Simon of Heidelberg is credited with the first deliberate nephrectomy on Aug. 2, 1869. He had previously determined, as a result of animal experimentation, that removal of one kidney would not interfere with continued normal life provided the remaining kidney was in a healthy state. The indication for this operation was a left ureterovaginal fistula resulting from a previous hysterectomy in a woman aged 46. The patient was known to be alive and well two years later.

Immediately following the work of Simon the mortality associated with nephrectomy was so great as to cause its employment only infrequently. Following the development of aseptic surgery with the improvement in anesthesia and surgical technic the operative mortality has decreased until it is not greater than that associated with other major surgical procedures.

In 1902 Kuster collected the statistics of 1,521 nephrectomies performed by different surgeons giving a mortality for all cases of 34.36 per cent for the transperitoneal and 12.08 per cent for the extraperitoneal removal of the kidney.[1] Since that time the operation has become a common procedure and the mortality now reported by skilled urologists varies between 2.0 and 6.0 per cent.

Your chairman wishes to discuss as briefly as possible a personal experience in private practice during the past twenty-two years in which 219 nephrectomies have been performed. The personal relationship with these patients has permitted a relatively complete follow-up record.

As will be readily understood, the underlying pathologic condition classified as hydronephrosis, pyonephrosis and lithiasis renders complete differentiation impossible.

There have been five operative deaths, a mortality of 2.28 per cent. A man aged 21 with a huge right caseous tuberculous kidney died forty-eight hours after operation with multiple pulmonary emboli. The renal pedicle could not be ligated without injury to the inferior vena cava. Had pedicle clamps been left in situ without ligature, the result might have been different. A man aged 68, greatly debilitated from renal hemorrhage and pain, died on the fifth day after the removal of a large hypernephroid carcinoma. One woman, aged 56, died on the sixteenth postoperative day after removal of a right pyonephrotic kidney; clamps had been left on the pedicle for three days following an unsuccessful attempt at ligation. Sepsis was the cause of death. Another woman, aged 52, who had had two previous operations for right renal calculi, died on the fifth day after the subcapsular removal of a chronically pyonephrotic kidney. Shock and sepsis caused death. A man aged 72 died of coronary throm-

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1. Mathe, Charles P.: History of Urology, Baltimore, Williams & Wilkins Company, vol. 4, chapter XV, p. 300.

bosis on the third postoperative day after removal of a right kidney filled with staghorn calculi. The patient had long postponed operation, which was finally imperative to relieve constant pain.

Gutierrez,[2] among others, has called attention to the desirability of performing carefully planned nephrectomy in two stages when the patient has advanced pyonephrosis and is too ill to be subjected to primary nephrectomy. Drainage of a pyonephrotic kidney to relieve the gravity of the symptoms before a radical operation is undertaken is occasionally a wise procedure, and it may be the means of saving the life of the patient.

It is to be noted that in this series nephrectomy was performed with almost equal frequency for tuberculosis, lithiasis and pyonephrosis.

RENAL TUBERCULOSIS

There were 42 nephrectomies for renal tuberculosis. One death, already mentioned, made an operative mortality rate of 2.38 per cent. Because of extensive ureteral involvement, complete removal of the ureter and kidney (primary nephroureterectomy) was performed in 4 instances. Evidence of continued tuberculous activity prompted secondary ureterectomy in 2 cases. This proved to be a valuable procedure in this limited experience, as shown by rapid improvement in previously intractable tuberculous cystitis. In none of our patients was the ureter brought out to the skin. In most instances the stump after being doubly ligated was treated with phenol or the actual cautery and anchored by suture to the edge of the psoas muscle. Only two wounds broke down, and these were successfully closed after four months by débridement and secondary suture. Primary healing occurred in 28 patients, a draining sinus persisting for from two to fourteen months in 11 patients.

Occurence of 219 Nephrectomies

Primary Indication for Nephrectomy	Decade								
	1st	2d	3d	4th	5th	6th	7th	8th	Total
Tuberculosis	1	2	18	15	4	2	..	..	42
Lithiasis	..	1	5	11	15	6	2	1	41
Pyonephrosis	1	3	8	12	9	5	2	..	40
Hydronephrosis	1	9	14	3	2	1	..	..	30
Renal tumor	..	..	..	1	12	13	3	..	29
Pelvic tumor	..	..	1	3	3	2	1	..	10
Ureteral tumor	..	..	..	1	2	1	..	..	4
Trauma	..	1	2	2	1	..	..	..	6
Atrophic pyelonephritis	1	2	2	1	..	..	..	..	6
Carbuncle of kidney	..	2	1	..	1	..	..	..	4
Ectopic kidney	..	1	3	1	..	..	..	..	5
Solitary cyst kidney	..	..	..	1	..	1	..	..	2
Total	4	21	54	51	49	31	8	1	219

Twenty-six of the tuberculous patients were females and sixteen were males. The youngest was a boy of 8 years operated on on July 26, 19[illegible]2 and now in perfect health. The oldest was a man aged 64, operated on on Oct. 30, 1928, who now repo[illegible]s doing some work on his farm and enjoying "fair" health at the age of 78. Thirty-six of these patients have complete follow-up data. Four, all women, died with urinary tuberculosis between three and five years after operation. A man operated on on Jan. 20, 1925 at the age of 30 died in the Walter Reed Hospital in October 1938 from ascending urinary tuberculosis, which had been observed for thirteen years but could not be halted by any climatic or sanatorium treatment. It is possible that a cutaneous ureterostomy performed in time might have saved this patient's life. One woman operated on ten years ago is dying of carcinoma of the uterus but without evidence of urinary tuberculosis. Four patients died after seven, eight, ten and twelve years respectively from causes other than tuberculosis. Twenty-one patients are known to be alive and well without evidence of urinary tract tuberculosis after periods of from twenty-one years to one year after operation. Four patients are alive and active more than five years after nephrectomy but continue to suffer from tuberculosis of the bladder. Three of these have tubercle bacilli in the urine. Four of the sixteen men also had unilateral genital tuberculosis. Seven of these patients had had bone tuberculosis, all apparently healed at the time of nephrectomy.

I believe with Colby,[3] as frequently emphasized by Gilbert Thomas, that whenever possible all patients with renal tuberculosis should have the preoperative benefit of treatment similar to sanatorium care. In this way the general health may be greatly improved and an increased resistance to infection established. Unfortunately only 10 of these patients could be so treated. The same general principles apply after nephrectomy, including the judicious use of old tuberculin injections given intradermally. Eight of the younger patients have found new homes in the Southwest, where general climatic conditions are more favorable for their continued good health.

LITHIASIS

Forty-one patients had the kidney removed because of stone formation. Nine of these had recurrent stone and had previously been subjected to pyelotomy or nephrotomy. I had formerly removed stones from the opposite kidney of 5 other patients. One patient, classified under lithiasis, had no stones in the pelvis, but the kidney having been removed for severe recurrent hemorrhage was found to have multiple collections of minute uric acid calculi filling the renal tubules. This condition has been described by Lichtenstern[4] as "microlithiasis." This patient has had no trouble in the remaining kidney during the past twelve years. Huggins[5] has called attention to the frequency of microliths occurring in "stone forming" kidneys, and it is possible that these may have been present in others of our group and escaped recognition by the pathologist. There was one death in this group, an operative mortality of 2.43 per cent. The youngest patient was a girl of 16 and the oldest a man of 82. Only 31 of these patients have complete follow-up records. Four are dead from causes not associated with the urinary tract after five, eight, nine and eleven years. Three patients died four, six and ten years after nephrectomy with infection in the remaining kidney. Twenty-four patients are alive and well, but 3 have calculi in the remaining kidney and 6 others have had recurrent attacks of pyelonephritis.

2. Gutierrez, Robert: Nephrostomy as a Preliminary Drainage in Preparation for Secondary Nephrectomy, J. Urol. 31: 305 (March) 1934.

3. Colby, Fletcher: Renal Tuberculosis and Sanatorium Care, J. Urol. 44: 401 (Oct.) 1940.

4. Lichtenstern, R.: Mikrolithiasis, Wien. klin. Wchnschr. 39: 1136, 1926.

5. Huggins, C. B.: Bone and Calculi in the Collecting Tubules of the Kidney, Arch. Surg. 27: 203 (July) 1933.

Postoperative measures have been directed toward the elimination of focal and renal infection, correction of dietary habits as determined by the chemical analysis of the stone, added vitamin ingestion and attention to proper urinary drainage of the remaining kidney. In recent years derivatives of mandelic acid and sulfanilamide have aided greatly in the elimination of infection in the remaining kidney. Parathyroid disease was not found in this series, although it has been observed in association with 3 patients with bilateral renal calculi, none of whom were subjected to nephrectomy.

Control of urinary stone formation is still the goal of every urologist. This is a complex problem and notable progress has been made, but much additional work remains to be done.

PYONEPHROSIS

Nephrectomy was performed on 40 patients with chronic massive infection of the kidney. The majority of these patients were in the fourth and fifth decades of life. There were two deaths in this group, an operative mortality of 5.0 per cent. Seven of these had been previously subjected to surgery for renal calculi. In my experience the removal of a chronically pyonephrotic kidney is often the most difficult nephrectomy. Dense adhesions to all the surrounding structures, difficulty in ligation of the renal pedicle and chronic sepsis in a debilitated patient make this operation a formidable one in the most experienced hands. Three of these patients were operated on in two stages. All recovered. Eight kidneys were removed by the subcapsular method. Two of the latter patients died. The youngest patient was a boy of 6 years now living and well at the age of 18. The oldest, a man of 74, lived in comfort for five years, when death occurred from pneumonia. Three of the older patients died after three, nine and eleven years respectively with infection of the remaining kidney. A girl of 18 developed a pyonephrosis in the right kidney five years after removal of the left one for pyonephrosis. A nephrostomy was done and the patient lived a miserable existence for three years, when she died in uremia. Twenty-six of these patients are known to be alive, 11 more than five years and 15 more than ten years. Modern urinary chemotherapy has been responsible for the elimination of infection in the remaining kidney of 10 patients during the past five years.

HYDRONEPHROSIS

While conservation of the kidney by pyeloplastic procedure is the method of choice in hydronephrosis,[6] nephrectomy is indicated when renal destruction is so advanced that restoration of function is impossible. This condition resulted in thirty of the nephrectomies in this series. The majority of these patients were in the second and third decades of life. Successful conservative procedures were carried out on 7 patients on the opposite life sustaining kidney before the functionless one was removed. There was no death in this group. Twenty-seven of these patients have been accurately observed since operation. Only 1 is known to be dead, as a result of a motor accident.

The bilateral tendency of congenital hydronephrosis makes it imperative that the remaining kidney be carefully studied at suitable intervals. Excretion urography has proved to be an informative follow-up procedure.

6. O'Conor, Vincent J.: Conservative Surgery of Hydronephrosis, J. Urol. 46: 1051 (Dec.) 1941.

TUMORS OF THE ADULT KIDNEY

In this series of 29 patients operated on for renal cortical tumors in which there was one operative death, only a few interesting facts were developed by careful follow-up study. Sixteen were males and 13 were females. The youngest patient was 37 years old; she is living and well more than three years after operation.

Six patients died within the first twelve months. Ten patients died between two and one-half and three years after operation. Autopsy in one of these, a man aged 63 at death, showed no evidence of tumor, death having been due to pneumonia. One patient operated on in 1932, and in apparently good health for nine years, is dying with what appears to be metastatic hypernephroid carcinoma of the brain.

Nine patients are living and apparently well. A woman aged 50 at the time of operation on Aug. 27, 1933 is apparently in good health. Two patients are well after eight and seven years respectively. Six patients are living and without apparent recurrence for more than four years but less than six years. Three of these 29 patients can hardly be considered in a survival rate study, other than operative, since only eight, eleven and fourteen months, respectively, have elapsed since operation.

TUMORS OF THE RENAL PELVIS

In this series there have been 10 patients with tumors primarily arising from the renal pelvis. Eight of these were papillary carcinomas and two were of the squamous cell variety. The youngest patient in this group, a man aged 29, had a papillary growth in the bladder and a large papillary carcinoma of the renal pelvis. He is well nine years after complete nephroureterectomy and suprapubic coagulation of the bladder implant. One patient lived seven years after nephrectomy and then died of pneumonia. Autopsy showed no recurrence. Another patient lived eleven years after nephrectomy and died at the age of 80 years with carcinoma of the rectum. A woman, in whom all of the ureter except the intravesical portion was removed with the kidney for papillary carcinoma, died four years and two months later with massive recurrence in the ureter and bladder. Another patient with multiple bladder implants died of urosepsis three years and five months after complete nephroureterectomy. Three patients are living and apparently well six, five and four years, respectively, after complete nephroureterectomy for papillary carcinoma of the renal pelvis. Both patients with squamous cell carcinoma died within one year after nephrectomy.

As will be noted from this small experience, the prognosis in papillary carcinoma of the renal pelvis has been relatively favorable. This has been due in large part to the recognition of the necessity for doing complete nephroureterectomy (including the intramural portion of the ureter) in every instance in which this type of tumor is recognized.

PRIMARY TUMOR OF THE URETER

There were 4 patients, all males, in whom complete nephroureterectomy was done for primary tumor of the ureter. These patients are all living and apparently well, five years, three years, two years and fourteen months, respectively. In each the growth was diagnosed as papillary carcinoma and there was no invasion of the renal pelvis or bladder.

TRAUMA

Under the heading of trauma I include 2 patients whose kidney was removed because of massive hemorrhage after accidental rupture by violence; one by perforation from gunshot and three for persistent ureterovaginal fistulas from surgical accidents during hysterectomy. During this time the diagnosis of ruptured kidney has been made in our service on 48 persons, and, since only 2 required nephrectomy as an emergency measure, I feel that conservative treatment in these cases should be given full consideration before operative intervention is undertaken.

ATROPHIC PYELONEPHRITIS

Atrophic pyelonephritis is given a distinct classification in this series because this condition represents a slow progressively destructive lesion of the kidney, occurring in my experience in younger persons. Six of these patients have survived for from periods of ten to five years after nephrectomy.

CARBUNCLE OF THE KIDNEY

Four patients had the kidney removed because of massive carbuncular disorder. In none of these instances did it seem wise to attempt enucleation of the carbuncle or incision and drainage. These patients were 17, 19, 21 and 40 years of age, respectively. All recovered and are living and well over periods of twelve, eleven, six and five years. While it is always advisable to attempt less radical measures than nephrectomy in carbuncle of the kidney, massive involvement may make nephrectomy imperative.

ECTOPIA OF THE KIDNEY

Ectopia of the kidney has been classified separately as an indication for nephrectomy. In this series 2 males and 3 females suffered from unilateral sacral ectopia of the kidney. In the men hydronephrosis and pyelonephritis with multiple calculi constituted the primary pathologic conditions. In the women pain and recurrent pyelonephritis prompted nephrectomy. In 2 of the women dystocia had occurred because the misplaced kidney interfered with the passage of the fetal head. Renal pain and recurrent infection resulted and the previously symptomless kidney developed indications for nephrectomy. All these patients are living and well from three to eleven years after operation.

Nephrectomy for unilateral sacral ectopia is somewhat more difficult than the usual lumbar operation. The kidney which is molded in the hollow of the sacrum has a multiple and varied blood supply. It might be emphasized that if a urologic examination, made before or during pregnancy, reveals renal ectopia, a definite indication exists for abdominal cesarean section. Two patients, so delivered, have had no trouble in the nontraumatized ectopic kidney during the past five years.

SOLITARY CYST OF THE KIDNEY

Solitary cyst of the kidney is rarely an indication for nephrectomy. These benign cysts can usually be resected or destroyed without interference to continued renal function. The cysts of 2 patients, however, occupied the central portion of the kidney and had caused such advanced renal destruction that it was advisable to remove the kidney. Both patients recovered and are living and well five and nine years respectively after operation.

HORSESHOE KIDNEY

In 7 patients of this series one half of a fused kidney was removed after division of the isthmus. Two were hydronephrotic, 1 was tuberculous, 3 were pyonephrotic and 1 contained multiple recurrent calculi. All these patients recovered and have normal function in the remaining renal tissue. All were operated on through the extraperitoneal lumbar approach.

NEPHRECTOMY AND HYPERTENSION

Goldblatt [7] and others have shown that the production of renal ischemia by constriction of the renal artery is followed by hypertension in animals. When the kidney so affected is removed, the blood pressure returns to normal. An increasing record of clinical observations [8] by many urologists has shown that hypertension may result from pathologic conditions of the kidney. When this disease is unilateral and the opposite kidney is functionally normal and unaffected, nephrectomy may be followed by a reduction in the blood pressure level in a varying percentage of individuals.

In our series there were 9 patients in whom nephrectomy was followed by an apparently permanent improvement in their hypertensive condition. The indication for nephrectomy in these patients was calculus disease 3 patients, hydronephrosis 3, congenital hypoplasia 2 and primary tumor of the ureter with hydronephrosis 1.

A larger number of patients were observed who had a temporary relief of hypertension for periods of a few months to one year. In these the blood pressure gradually returned to the preoperative level. In the 9 patients cited the relief of hypertension has continued for from three to nine years and is therefore regarded as having been directly due to the nephrectomy.

COMMENT

As Deming [9] has recently stated, it is not enough to compile and discuss mortality figures of a series of nephrectomies. It is important for us to learn from our own experience, coupled with that of others, what factors will give us a lower operative mortality and an improved long range prognosis for the patient. Nor should our responsibility to the patient terminate with his successful convalescence from the operative procedure. We must firmly convince the patient that intelligent cooperation with his physician will often enable him to avert the development of lesions in his remaining kidney.

There are a number of factors, aside from the age at operation, which influence the length of life after unilateral nephrectomy. Some of these factors depend on the patient's attitude toward his future mode of life, while others depend on the physician's recognition of the problems which may arise. The prevention of recurrent calculus formation, the elimination of systemic and urinary tract foci of infection, and the maintenance of adequate urinary drainage are prime necessities after nephrectomy.

Aside from the danger of recurrence in malignant disease and in advanced urinary tuberculosis, such a program, intelligently enforced, should lead to a normal expectancy of life in most instances.

55 East Washington Street.

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ODOR IN THE ORR TREATMENT OF OSTEOMYELITIS AND ITS PREVENTION BY LACTOSE

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One of the few aspects of the Orr treatment of osteomyelitis about which there is universal agreement is the unpleasantness of the odor which is apt to develop in the casts. Remarkably little attention seems to have been paid to the cause and prevention of this odor. It is our purpose herein to offer a hypothesis as to the cause and to suggest a simple method for the prevention.

REVIEW OF THE LITERATURE

Orr [1] states that "bad odor is always due to a complicating mixed infection." Trueta [2] notes that the odor is worse when the wound is inadequately drained. Aside from this, we have been able to find no speculation as to the cause.

Various remedies have been suggested. Key [3] noted some decrease in the odor when using iodoform gauze soaked in balsam of Peru. McAleese [4] used oil of cloves paste instead of petrolatum gauze. Attempts to replace one odor with another are frequently made externally by sprinkling such substances as oil of cloves or oil of wintergreen on the surface of the cast. We have made a trial of sealing the pores of the cast by painting it with varnish or with celluloid dissolved in acetone. This served only to delay the appearance of the odor. Baer [5] stated that maggots stopped the odor during the first application. Trueta [6] recommended the application of brewers' yeast to the wound at the time of changing of the cast for the purpose of decreasing the odor. He said "a certain smell did remain, but it was less disagreeable." We have used this method in 2 cases without strongly affecting the odor. One patient had a transient urticarial reaction of moderate severity.

USE OF DEODORANTS IN THE DRESSINGS

We have tried impregnating the dressings with various deodorants. Of these the most effective was zinc sulfocarbolate. Gauze dressings soaked in a 2 per cent solution of this and dried before use definitely diminished the odor, but the results left much to be desired. Reference to the use of mercury bichloride in the plaster water will be made.

CAUSE OF THE ODOR

It seems obvious to the most casual observer that the well developed odor resembles nothing else so much as that due to the putrefaction of a decaying animal body, and this is the assumption on which we have proceeded. Rettger [7] points out that the term putrefaction "has acquired two distinct meanings. In the more general usage it signifies decomposition of protein material through bacterial action, as against fermentation or decomposition of carbohydrates." He prefers it "in the more restricted sense to mean anaerobic decomposition of protein with the production of foul smelling products which are characteristic of cadaveric decomposition." Protein breakdown in the wider sense is better referred to as proteolysis.

Writers on the subject of putrefaction stress the importance of the part played by anaerobic bacteria in the process.[8] In discussing the cause of the putrid odor in peritonitis following appendicitis, Altemeier [9] came to the conclusion that putrid pus always indicates the presence of anaerobic organisms. In the case of resistant radionecrotic ulcers following malignant tumors, Freeman [10] recovered anaerobic organisms from thirty-five lesions having a foul odor and noted that as the lesions became odorless under treatment with zinc peroxide the anaerobes disappeared, as shown by cultures taken, returning as the odor recurred on cessation of treatment. The demonstration of anaerobes by Trueta [2] in osteomyelitis wounds during healing furnishes an important link in the chain of evidence.

Contaminating organisms presumably gain access to osteomyelitis wounds by direct implantation at the time of operation or redressing. It is increasingly recognized that "asepsis" in the operating room is only relative. Cultures of "clean" wounds show contaminants in a high percentage.[11] Primary union of such wounds is a tribute to the resistance of the host. In osteomyelitis wounds a micro-organism on arrival would find an environment more favorable to survival than in wounds of more ordinary type. Warmth, moisture, suitable p_H and nutrient substances are present, particularly the products of autolysis to be mentioned later. The field is probably deficient in the cellular and humoral factors of immunologic resistance which protect normal tissues. The preexisting etiologic aerobes that have inevitably escaped the surgeon are creating an atmosphere favorable to anaerobes by exhausting the available oxygen. The pathogenic aerobes prepare the soil in another way also. As Weinberg and Ginsbourg [12] point out, highly proteolytic organisms are rarely pathogenic. They usually need the assistance of the more toxic, less proteolytic organisms in order to become established. However, since similar conditions prevail in ordinary soft tissue wounds, the probability arises that some unknown factor peculiar to bone is present. In any case, the fact that the wound is

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12. Weinberg, M., and Ginsbourg, B.: Recherches sur la putréfaction in vivo, réproduction expérimentale des traumatoses putrides, Ann. Inst. Pasteur **39**: 652-684 (Aug.) 1925.

covered and more or less sealed doubtless favors anaerobiosis. Similar odors may develop in covered soft tissue wounds if an element of pressure is added.

While it is theoretically possible for contaminants to reach the wound by way of the blood stream, the observations of Orr-Ewing, Scott and Gardner [13] indicate that this does not ordinarily occur. Through a small window incorporated in the cast they took cultures of material from compound fractures during treatment by the closed method and found that new organisms appeared only after changes of the cast.

Redressings under the closed cast method in cases of osteomyelitis are often performed without the operating room asepsis which Orr advocates. This may explain why odor is more likely to develop in subsequent casts than in the original.

ROLE OF AUTOLYSIS

The question arises as to the part played by autolysis in the proteolytic process under consideration. It seems likely that at least a narrow zone of tissue bordering the wound undergoes ischemic death immediately following an Orr débridement. The use of tincture of iodine and alcohol in the authentic Orr technic probably favors such necrosis. There is evidence which indicates that the protein breakdown products of the self digestion of this tissue are contributory if not essential to the proteolytic action of the anaerobic organisms. Sperry and Rettger [14] have shown that in the absence of cleavage producing substances like proteolytic enzymes (or strong acid or alkali) bacteria cannot initiate the decomposition of native or unchanged protein by direct action. Thus even the most actively proteolytic organisms may starve to death on egg albumin or serum albumin if there is not access to simpler nitrogenous substances from which to start the production of enzymes.[15] This may explain why devitalized muscle is necessary for the development of gas gangrene. Weinberg and Ginsbourg [12] call attention to the fact that inflammatory exudates contain protein breakdown products which are more readily attacked by many organisms than is native protein, but in a well débrided wound the autolytic process would probably be the first to become effective.

The importance of autolysis in putrefaction in vitro is indicated by the fact that, whereas inoculation of sterile muscle (obtained from a clean operation) with organisms from a foul osteomyelitis wound results in a characteristic putrid odor, putrefaction does not occur if the muscle has been autoclaved before inoculation, the autoclaving presumably destroying the autolytic enzymes.

On the other hand it may be shown that autolysis alone does not result in putrefaction. We have incubated at 37 C. fragments of sterile muscle in test tubes which were rubber stoppered to preserve moisture. These were examined periodically up to thirty weeks, and as long as they remain sterile no odor could be detected. Autolytic proteolysis proceeds only to the amino acid stage. Decarboxylation and deaminization (with the production of foul odors) occur only when the amino acids are further split.

NATURE OF THE ODORIFEROUS SUBSTANCES

Rettger and Newell [16] state that among the foul products of putrefaction mercaptans are important; indole, skatole and hydrogen sulfide are less important. According to Bodansky,[17] mercaptans may be formed by bacterial action on the amino acid cystine, which is present in higher percentage in bone than in muscle. Other foul products that may be formed are putrescine and cadaverine, derived respectively from the amino acids arginine and lysine.

The importance of mercaptans in the clinical odor under consideration is indicated by the fact that foul dressings from these wounds are immediately deodorized by immersion in a solution of mercury bichloride. The term mercaptan means "having an affinity for mercury," with which mercaptans react to form stable odorless compounds.[18] Clinical application of this principle was tried by adding mercury bichloride to the water in which plaster bandages were soaked, making a concentration of 1:1,000. This method was used in a few cases and definitely diminished but did not entirely eliminate the odor, probably for lack of intimate contact.

PROTEIN SPARING EFFECT OF CARBOHYDRATES

Proceeding on the assumption that the foul odor of osteomyelitis is of proteolytic origin, it seemed logical, by implanting a sugar in the wound, to take advantage of the well established principle that utilizable carbohydrate retards bacterial proteolysis. As Kendall, Day and Walker [19] express it, "fermentation takes precedence over putrefaction"; that is to say, those bacteria which can utilize both carbohydrate and protein attack the former in preference to the latter when the two are simultaneously available. When bacteria utilize protein merely for their structural needs, the nitrogenous products of proteolytic activity are not formed as they are when protein is utilized for fuel.[20] Availability of carbohydrate for fuel in this way spares protein, and foul products are not formed. The absence of putrefaction in raw milk is a commonplace illustration. This is also the principle on which have been based attempts to relieve so-called autointoxication by feeding lactose and Bacillus acidophilus. In fact, it was this method that first suggested to us the present application of lactose to osteomyelitis.

Dextrose reaching an osteomyelitis wound from the circulation would be inadequate in amount for this purpose, since its maximum concentration would be about 0.2 per cent, and furthermore it would be destroyed by the leukocytes of the exudate.

13. Orr-Ewing, J.; Scott, J. C., and Gardner, A. D.: Bacteriological Investigation of Wounds Treated by Closed-Plaster Method, Brit. M. J. 2:877-882 (June 14) 1941.

14. Sperry, J. A., and Rettger, L. F.: The Behavior of Bacteria Toward Purified Animal and Vegetable Proteins, J. Biol. Chem. 20:445-459, 1915.

15. Berman, N., and Rettger, L. F.: Bacterial Nutrition: Further Studies on the Utilization of Protein and Nonprotein Nitrogen, J. Bact. 3:367-388 (July) 1918.

16. Rettger, L. F., and Newell, C. R.: Putrefaction with Special Reference to the Proteus Group, J. Biol. Chem. 12:241-246, 1912.

17. Bodansky, Meyer: Introduction to Physiological Chemistry, ed. 4, New York, John Wiley & Sons, 1938, p. 212.

18. Degering, E. F., and others: An Outline of Organic Chemistry, New York, Barnes & Noble, 1937, p. 125.

19. Kendall, A. I.; Day, A. A., and Walker, A. W.: Observations on the Relative Constancy of Ammonia Production by Certain Bacteria: Studies in Bacterial Metabolism: X, J. Infect. Dis. 13:425-428 (Nov.) 1913.

20. Kendall, A. I.: Significance and Quantitative Measurement of Nitrogenous Metabolism of Bacteria, J. Infect. Dis. 30:211-224 (Feb.) 1922.

Such benefit as has been obtained by the implantation of fresh brewers' yeast in these wounds may be due to sugars present in the yeast mixture.

The mechanism whereby protein is spared by utilizable carbohydrate will be made the subject of a separate report.

CHOICE OF SUGAR AND CONCENTRATION

In the selection of a sugar for clinical use, the choice seemed to lie between dextrose and lactose. Both are normally present in the body, fermentable by a wide variety of organisms, readily available commercially, cheap and harmless. Lactose was chosen instead of dextrose because of the probability that the latter would be destroyed by the leukocytes in the wound.[21] Lactose is not subject to such destruction.[22] Lactose is also preferable for physical reasons; since its molecule is larger than that of dextrose a solution of it isotonic with the blood contains more sugar, and loss by absorption from the wound should be less. If lactose were absorbed from a granulating surface, it presumably would be excreted in the urine as in the lactosuria of lactation. In 2 of our cases in which tests were made, forty-eight hour specimens of urine following implantation contained no lactose.

In determining the concentration of lactose to be used, osmotic pressure was taken into consideration. Theoretically, a 10.8 per cent solution of lactose is isotonic with 0.85 per cent sodium chloride. Actually it was found in vitro that not until the lactose solution was made as weak as 2 per cent did well defined hemolysis occur, and in the other direction crenation of red cells was negligible at 18 per cent (saturation).[23] To insure an adequate amount of sugar for a period of weeks, relatively high concentrations seemed desirable. Accordingly for practical use a strength of approximately 18 per cent was chosen. For periods longer than we have used to date it is possible that higher concentrations may be needed. These could be provided by adding crystalline lactose to the dressings.

CLINICAL USE

U. S. P. lactose is dissolved, with the aid of slight heating, in distilled water to make an approximately 18 per cent solution. This is autoclaved in Erlenmeyer flasks, each containing about 50 cc. The flasks are capped with parafilm and stored until needed. Flasks showing visible growth of mold should, of course, be discarded. When a wound is to be dressed the contents of a flask are emptied into a sterile cup and the wound is filled with gauze dressings that have been dipped into the solution. About 50 cc. suffices for a wound of moderate size. Petrolatum gauze is not used. This pack is covered with a few dry dressings and the cast applied in the usual manner. The lactose is not allowed to come in contact with the plaster lest crumbling occur.

There would seem to be no risk involved in implanting this material, particularly in a granulating wound. White [24] has shown that granulation tissue is an excellent barrier to harmful substances. In his experimental animals large amounts of tetanus toxin were placed in wounds without ill effect provided the wounds were at least five days old. He refers to similar protection demonstrated by Billroth (1865) who implanted putrid pus and by Afanassieff (1896) using anthrax bacilli. The development of a granulation tissue barrier may explain the postoperative disappearance of toxemia under the Orr technic. The same barrier would probably prevent contaminating bacteria from entering the wound out of the blood stream.

For use in a fresh wound at the time of operation the solution should be made with freshly distilled water as an added precaution against contamination with spores. That is, the solution should be made and autoclaved before the distilled water is more than 2 hours old. Although we have not tried it, tap water could probably be substituted for distilled water in preparing solutions for use in old wounds provided fractional autoclaving is carried out.

RESULTS

Laboratory demonstration of the effectiveness of this method is easily made. A piece of raw butcher's meat is placed in each of two test tubes and inoculated with exudate or organisms from a foul osteomyelitis wound. To one tube is added a sugar free broth or other liquid and to the other a lactose solution. Within two to five days a putrid odor develops in the sugar free tube, growing progressively stronger, whereas in the lactose tube it fails to become established. Furthermore, visible disintegration of the meat proceeds much more slowly in the latter. In vitro a cheesy odor is apt to develop in the lactose tube, but this is not evident in vivo, perhaps because of systemic absorption of lactic acid.

The clinical effectiveness corresponds to that in the test tube. Thus far we have used the method in 6 cases, 1 of which failed to respond. In the other 5, casts were maintained for periods up to six weeks without the development of a putrid odor. After seven weeks a slight odor, partly ammoniacal, partly foul, was detected in the immediate proximity of the cast. In these 5 cases the method was instituted at the time that the cast was changed, the condition of all of them being already definitely foul. In the sixth and unsuccessful case the method was instituted at the time of sequestrectomy. At that time the patient had had a foul sinus for more than two years. The failure is attributed to the presence of a putrefactive organism incapable of utilizing lactose. Exudate from this wound caused putrefaction of meat in a test tube despite the addition of lactose.

In 1 case a convincing control was established as follows: the putrid odor having been abolished by lactose, the latter was purposely omitted from a subsequent cast, whereupon the odor definitely returned and was again abolished by the addition of lactose to the next cast. In this case a foul sinus had been present for twenty-five years previous to operation.

In the course of our clinical use of lactose unexpected additional benefits became evident. Both the amount of exudate and the tendency to excoriation of the surrounding skin seem to be diminished. This is probably related to the fact that the production of proteolytic enzymes is inhibited, in the case of most organisms, by the presence of utilizable carbohydrate,[25]

21. Falcon-Lesses, Mark: Glycolysis in Normal and in Leukemic Blood, Arch. Int. Med. 39: 412-420 (March) 1927.

22. Dilworth, Margaret J., and Wallis, A. D.: Unpublished data.

23. Coating of erythrocytes by a viscid protective film of sugar may be responsible for the width of this range of safety.

24. White, M.: Protective Action of Granulation Tissue Against Absorption of Toxins: Experiments with Tetanus Toxin and Cobra Venom, Lancet 1: 1293-1294 (June 13) 1931.

25. Kendall, A. I.: Bacterial Metabolism, Physiol. Rev. 3: 438-455 (July) 1923.

indicating that the biologic habits of the organism have been changed.

No ill effects have been noted. The gauze is easily removed from the wound, which is not always the case when petrolatum gauze has been used. The usual healing process is not impaired.

COMMENT

That lactose in solution is not itself a deodorant can be demonstrated by placing a piece of foul dressing in it.

Discussion of the specific bacterial flora of these wounds has been omitted as it has, with a few exceptions, no direct bearing on the principle involved. Several observers have shown that a wide variety of bacteria is present up to the time of healing.[26] There are not many organisms that cannot attack sugar. Bacillus pyocyaneus is one of these, and the lactose method does not abolish its odor, which, however, is nonputrid and not particularly penetrating or objectionable. Among the putrefactive anaerobes, Clostridium histolyticus is an exception in being unable to ferment carbohydrate, and one would not expect a wound contaminated with this organism to respond to lactose.

We cannot agree with suggestions that a putrid odor occurring in a case of osteomyelitis is necessary or even beneficial. Trueta [2] states that the odor is not without some clinical significance. Donaldson and Joyce [27] noted that war wounds under the Wright hypertonic salt pack treatment were apt to do poorly when odor was lacking. They implanted the "Reading bacillus" (Clostridium sporogenes) in such wounds with development of a foul odor and clinical improvement, which they attributed to proteolysis and possibly detoxification, but it seems significant that before implanting the organisms they did a thorough débridement.

Lactose should prove a valuable addition to the Trueta closed cast method of treating compound fractures.[28]

This principle should be applicable to the deodorization of putrid ulcerating malignant tumors or of ischemic gangrene from diabetes or other cause. In foul paranasal sinus infections or pulmonary abscesses crystalline lactose might be applied by insufflation.

It is a basic principle of the Orr method that frequency of changes of a cast has a definite influence on the rate of healing; the less often the cast is changed the more rapid will be the recovery. The use of lactose prolongs the interval between changes of the cast by diminishing the odor, the exudate and the cutaneous irritation, which are probably the three most common reasons for changing the cast.

If the use of the sulfonamides fulfils its early promise of making possible primary closure of osteomyelitis and compound fracture wounds, the Orr method will have only occasional application. In that case the greatest usefulness of lactose may well be found in nonorthopedic lesions.

Whether lactose should be implanted at the time of débridement as well as when the cast is changed is a question that remains to be decided. Perhaps the answer will depend on the circumstances of the individual case.

SUMMARY

The foul odor in osteomyelitis wounds treated by the Orr method is attributed to putrefaction by anaerobic bacteria accidentally implanted in the wound. Autolysis of devitalized tissue probably helps to initiate the proteolysis. Through the protein sparing effect of carbohydrates, putrefaction may be retarded by implantation of utilizable sugar in the wound. For these reasons it is proposed that sterile 18 per cent aqueous lactose be added to the dressings at the time that the cast is changed.

CONCLUSIONS

1. The addition of lactose into osteomyelitis wounds under the closed cast method has abolished the putrid odor in 5 of 6 cases. The usual healing process is not impaired.

2. The use of lactose seems to diminish the amount of exudate and the tendency to cutaneous irritation.

3. The use of lactose is suggested for deodorization of putrid lesions of nonosseous origin.

William A. Wolff, Ph.D., biochemist to the Pennsylvania Hospital, Philadelphia, aided in this work by giving many helpful suggestions.

Greene and Coulter streets.

26. d'Harcourt, J.; Folch, A., and Oriol, A.: Closed Plaster Method of Treatment; Account of Its Use During Spanish War, Brit. M. J. 1: 652-654 (April 20) 1940. Leriche, René: Listerian Idea in 1939, Lancet 1: 863-868 (April 8) 1939. Orr-Ewing, Scott and Gardner.[19] Trueta.[2]

27. Donaldson, R., and Joyce, J. L.: A Method of Wound Treatment by the Introduction of Living Cultures of a Spore-Bearing Anaerobe of the Proteolytic Group, Lancet 2: 445-452 (Sept. 23) 1917.

28. Wallis, A. D., and Dilworth, Margaret J.: Lactose for Prevention of Odor in the Closed-Cast Treatment of Compound Fractures, Brit. M. J. 1: 750-751 (May 17) 1941.

ABSTRACT OF DISCUSSION

DR. FRITZ TEAL JR., Lincoln, Neb.: Having spent twelve years with Dr. Orr, I am expert on the smell in osteomyelitis. Dr. Wallis has shown how to eliminate considerable of the odor. By inverting the chemical or biologic change from one of putrefaction to one of fermentation, he has done away with the odor, which has been one of the objectionable features. Albee showed a good many years ago that Clostridium perfringens was often found in osteomyelitis wounds but did not cause symptoms. He cultured these organisms and injected them into laboratory animals and was able to show that they were virulent. The outstanding thing to me is that a wound will stand the presence of large numbers of different types of bacterial anaerobes and aerobes without causing symptoms. As far as I know, no one has made a study of what happens in such a wound from the standpoint of the healing of the wound. We have had studies of wound healing in normal operations, but is the change that occurs in the wounds that are treated in this manner due to the development of granular membrane or to the lymphatic stasis produced by immobilization, as suggested by Trueta? I think that his work has been admirable and will probably be a great boon in the treatment of this condition, since it has been shown for many years that the petrolatum itself is not an important part of the treatment. If the wound is packed open with any type of gauze, paraffin or any other substance, the effect is the same, provided the postoperative care is carried out. One of the most important factors in our clinic in minimizing the odor, and Dr. Wallis has already stressed that, is the time which elapses between changes of dressing. In our cases, when we operate primarily, we feel that the odor is kept to a minimum by dressing these patients not oftener than every six weeks. The worst offenders are the mixed tuberculous infections such as we have in Indians, and Dr. Wallis has explained just why that is the case.

DR. LENOX D. BAKER, Durham, N. C.: The theory explaining the odor associated with the Orr therapy is apparently well founded. The authors have presented a method of combating

this factor and I for one intend to use the method. It is to be regretted that time did not allow a reading of the entire paper, as some of the most interesting findings have been omitted in the presentation. Dr. Wallis mentioned another treatment—the local use of sulfonamides and primary closure, which, when successful, results in healing by first intention without drainage. The discusser surveyed the American Academy of Orthopaedic Surgeons as to the results from the local implantation of the sulfonamides in acute compound fractures, in acute osteomyelitis, in old compound fractures with infection and in chronic osteomyelitis following saucerization. The results in the latter two groups should be of interest and are presented in the accompanying tables. This survey indicates that the desired method of treating chronic osteomyelitis is thorough surgery, a local sulfonamide and primary closure.

Results in Old Compound Fractures with Infection

	Total	Healed	Infected
Open reduction plus chemotherapy	47	30	17
Sulfanilamide	14	7	7
Primary closure	7	5	2
Open method	7	2	5
Sulfathiazole	33	23	10
Primary closure	20	17	3*
Open method	13	6	7

* All had drains twenty-four to forty-eight hours.

Results in Chronic Osteomyelitis

	Total	Healed	Infected
Surgery plus chemotherapy	74	54	20
Sulfanilamide	11	7	4
Primary closure	4	4	0
Open method	7	3	4
Sulfathiazole	63	47	16*
Primary closure	41	36	5
Open method	22	11	11

* Seven later healed; three had severe flareups.

DR. ALLAN D. WALLIS, Philadelphia: With regard to Dr. Baker's mention of the relation between healing and odor I have no comments to make, because I can't say that we have observed that relationship particularly. As far as liquefaction and autolysis and their relation to the healing process are concerned, I am not convinced that there is any connection. We don't feel that odor is in any sense necessary or that the processes which produce odor contribute anything to the healing of the wounds.

Composition of the Body.—Approximately 99 per cent of the mass of the human body is made up of six elements: oxygen (65), carbon (18), hydrogen (10), nitrogen (3), calcium (2) and phosphorus (1). The remaining 1 per cent is distributed between potassium (0.35), sulfur (0.25), sodium (0.15), chlorine (0.15), magnesium (0.05), iron (0.004) and smaller amounts of iodine, fluorine, copper, zinc, and so on. The protoplasm of other animals and of plants is made up of essentially the same elements but in different proportions. Evidently the elementary composition of protoplasm tells us very little as to what it is. In protoplasm these elements are combined into proteins, fatty substances, carbohydrates, many other organic molecules, water and mineral salts. However, such substances individually and when mixed in the laboratory are dead material. In order that living protoplasm may result, these various compounds must be brought together and organized in a highly specific way; and at present this can be accomplished only through the agency of other living protoplasm.—West, Edward S.: Physical Chemistry for Students of Biochemistry and Medicine, New York, Macmillan Company, 1942.

CLASSIFICATION AND MEDICAL RELATIONSHIPS OF HYPERTENSIVE-ALBUMINURIC PREGNANCY

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There are three concepts of the etiology of hypertensive-albuminuric pregnancy: (1) that it is the same disease and has the same etiology as in the nonpregnant state, (2) that it is the same disease as in the nonpregnant state plus additional disease directly due to the pregnancy, and (3) that it is a disease primarily due to the pregnancy.

1. If the first is true, then any classification of hypertensive-albuminuric pregnancy should be identical with the classification of such disease in the nonpregnant state. There are certain adherents to this belief and at times I have been one. The difficulty in accepting this view is the occurrence in pregnancy of the typical convulsive state called eclampsia, the clinical picture of which is not reproduced under any circumstances in the nonpregnant state.

Herrick has suggested that this syndrome may be regarded as "acute hypertension," but proof of this is lacking, and until it is supplied eclampsia must be regarded as an entity in itself.

With this exception, the clinical picture of all types of hypertensive-albuminuric disease in pregnancy is found in the nonpregnant state.

2. In addition to so-called preeclampsia and eclampsia, there are other clinical states which arise in pregnancy, such as the sudden appearance and disappearance of hypertension, edema and albuminuria, which may or may not be explainable on the same basis as in the nonpregnant state. It is therefore possible that these conditions are modified by something peculiar to the pregnancy itself.

3. The third concept that hypertensive-albuminuric pregnancy is something peculiar to pregnancy itself is in my opinion also tenable.

The possibility of concept 2 lies in the fact that, while hypertensive albuminuria and edema occur in the pregnant state as they do in the nonpregnant, they may be modified, as for instance by their exaggeration, very often acutely, and by their retrogression when pregnancy is over.

Concept 3 implies that these states are something peculiar to pregnancy and have no relation to similar conditions in the nonpregnant state.

Is there to be a classification according to the clinical syndrome presented or should the classification be one based on essential underlying disease? If the former, it is possible to place cases as one sees them during pregnancy in certain more or less arbitrary categories. The final classification of the individual case, however, may be possible only after a varying period of follow-up or after necropsy.

An illustration of this is case 1:

CASE 1.—A woman presented hypertension, albuminuria and edema in the last trimester of pregnancy. She was examined repeatedly both in pregnancy and in the postpartum period. Finally, about one and one-half years after her pregnancy, hypertension still persisting, it was noted that her kidneys were abnormally large, and appropriate x-ray studies revealed polycystic kidneys.

Read before the Section on Obstetrics and Gynecology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

In the presence of a gravid uterus the difficulties of diagnosis and classification are obvious.

The following is another illustrative case:

CASE 2.—A. S., a white woman aged 29, a quartipara, quartigravida, was admitted to Sloane Hospital April 17, 1923. Five years before (1918), when she was 24, her systolic blood pressure had been noted as 230. Two years later (1920) she had a miscarriage at three months. Nine months following

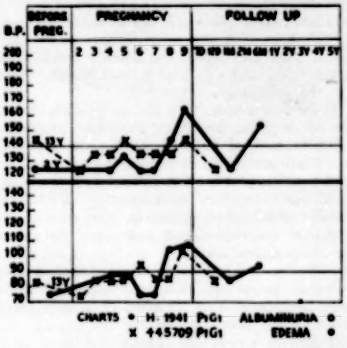

Chart 1.—A case of very mild hypertension preceding pregnancy, illustrating how hypertension can disappear in the second trimester of pregnancy.

the miscarriage she had an induced labor at six and one-half months for convulsions, severe hypertension, edema and severe albuminuria. Two years later (in October 1922) an early miscarriage took place. In the present pregnancy the blood pressure persisted with some minor fluctuations at 210 systolic and 120 diastolic for six months. Albumin was negligible and edema was absent. Nonprotein nitrogen was 27.8 mg. per hundred cubic centimeters of blood; urea nitrogen 13.8 mg., uric acid 2.5 mg., sugar 95 mg. and cholesterol 223 mg.; urine was sterile. One week prior to delivery albumin increased and edema of the face appeared. The patient was delivered of a full term child by cesarean section. For the next six years she was followed in medical clinics, where she was considered an example of hypertensive vascular disease. She died suddenly of a heart attack in 1929. Permission for autopsy was not given.

Consider the difficulties in diagnosis and of ultimate classification of these patients. The second patient's condition was an example of hypertensive disease prior to pregnancy, the convulsive state appearing in the second pregnancy. In her fourth pregnancy criteria of hypertensive disease were present for six months and then, shortly before delivery, evidence of the preconvulsive state appeared. Nearly all these months had been spent in the hospital, so it is very likely that the convulsive state was prevented by therapy. While the convulsion is emphasized for purposes of classification, its absence does not change the underlying disease. We therefore remain with a classification today which might be one of therapy rather than of disease.

The first case illustrates the fact that for purposes of study every means at our command should be undertaken to establish underlying disease. Clinical classification may be correct in the vast majority of cases of hypertensive-albuminuric pregnancy, but prolonged study may be necessary to determine the fundamental cause in every case.

The modification of nonpregnant hypertensive-albuminuric disturbance in pregnancy causes us difficulty in classification. Hypertension is generally aggravated, occasionally unaffected and rarely decreased. Whereas hypertension alone was present prior to pregnancy, albuminuria appears in the last trimester and disappears with delivery. Infrequently it persists. The albuminuria of chronic nephritis, pyelonephritis, congenital malformed kidney or of the calculous diseased kidney, while rarely unaffected, almost always becomes massive. Edema if present prior to pregnancy almost always increases. These adverse changes occur earlier when renal insufficiency is present but are commonly abrupt and generally occur in the third trimester.

A classification of hypertensive-albuminuric pregnancy must therefore include the causes of hypertension and albuminuria seen in the nonpregnant person. Hypertensive-albuminuric pregnancy may merely reflect vascular and renal disturbances which have no relationship to pregnancy.

The time relationship of classification is important and in itself has furnished a major difficulty; this relationship must take into consideration the time of the recognition of disease. For example, the observer sees patients who for one reason or another have blood pressure readings and urinalysis done prior to pregnancy. Abnormalities are then definitely known and their behavior in pregnancy is readily noted. But these patients are relatively few. By far the greater number, by reason of the absence of symptoms, are regarded as having been normal; unfortunately, absence of symptoms prior to the onset of pregnancy, or even a normal blood pressure and urine in the early months of pregnancy, does not permit of the assumption that the blood pressure and urine were normal before the onset of pregnancy. Hence, if patients are seen for the first

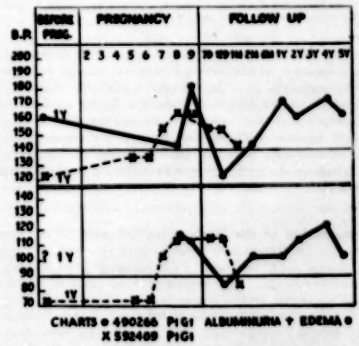

Chart 2.—A case of more severe hypertension preceding pregnancy, illustrating how hypertension can disappear in the major portion of the pregnancy.

time late in pregnancy, the significance of elevation of blood pressure and albuminuria can easily be misinterpreted.

The same picture as described in chart 1 can be simulated in pregnancy completely by the person who was entirely normal prior to pregnancy. Is one to regard the cases of preexisting disease and those in which the first manifestation occurred during the pregnancy as one and the same? Our evidence at Sloane

Hospital favors this view on the basis of a series of 188 cases reported by Herrick and myself. But whether they should be identically classified in pregnancy is a moot question.

Cases are seen in which the hypertension is more severe. For example, in the former case hypertension preceded pregnancy; in the latter the blood pressure was normal one year prior to the first pregnancy. From the eighth month on, however, there was little difference between the 2 cases; in the absence of information prior to the pregnancy, one might easily classify the two as identical cases, but they are decidedly different.

Classifications have been suggested which depend on the behavior of hypertension and albuminuria in the postpartum period. This point of view immediately causes trouble. Postpartum observations vary for many reasons. The duration of hospital observation is variable, and consideration must be given to racial, social and economic factors; in addition, complications such as shock and infection, particularly kidney infections, produce changes in blood pressure and in the urine. The ultimate conclusion may depend on whether the period of postpartum observation has been ten days, two weeks, six weeks, three months, one year or a lifetime.

Should one therefore have a temporary classification in pregnancy followed by a reclassification at a later date? A procedure of this sort calls for an elaborate system of records; patients will not or cannot all return, and so only a small percentage of the patients may be classified. The work is tedious and most of it unnecessary, and still it must be done in every case if the record is to be of value statistically. Obviously other than for purposes of study such a method is impracticable.

Further difficulties in classification are encountered when the criteria of hypertensive-albuminuric pregnancy are reviewed. These are hypertension, albuminuria, edema and convulsions. The various classifications depend on the interrelationship of these findings. The time of appearance, degree, duration and rapidity of resolution after delivery furnish the bases.

The convulsions may precede but almost always follow hypertension, albuminuria and edema, and while its specific causation is not understood it is just an additional manifestation of the disturbance. Its dramatic nature, however, permits clearcut demarcation in classification.

Another difficulty is in classifying the normal and the abnormal pregnancy. The blood pressure reading arbitrarily adopted as normal in most clinics varies from 130 to 140 systolic and 90 diastolic. Minor degrees of hypertension are frequently seen on two or three occasions during pregnancy. The rises may be transient, particularly when noted early in the middle trimester. Only when sufficient time has elapsed can one say whether the pregnancy is normal or abnormal, or whether these rises are functional or pathologic. Similarly, albuminuria appears in slight degree in a number of pregnancies which never exhibit further disturbance. Albuminuria of this type as yet is unsatisfactorily explained. Such albuminuria is probably innocuous but its presence is disturbing and always leads to the suspicion of abnormal pregnancy. Edema is even more difficult to interpret. Nearly every pregnant person at some time or other during pregnancy, more commonly in the last trimester, has edema. When unsupported by other evidence, it is generally disregarded, but the question remains Is it abnormal or physiologic?

Hypertension, albuminuria and edema are symbolic of numerous widespread disturbances. The common occurrence of these diseases in the nonpregnant state influences the way in which hypertension, albuminuria and edema in pregnancy are regarded.

When the patient is seen for the first time in the last trimester of pregnancy and has hypertension, albuminuria and edema, singly or in combination, it may be impossible to say whether there was an underlying disorder prior to the pregnancy or whether the symptoms were solely the result of the pregnancy. The syndrome is identical in the 2 cases. This last statement is, of course, open to criticism, but I think that the evidence still favors the belief that acute hypertensive-albuminuric pregnancy with or without convulsions can occur in the absence of as yet demonstrable preexisting disease. This conclusion is based on careful clinical examination, chemical analysis, urologic examination, including bacteriologic examination, intravenous and retrograde pyelography and necropsy studies. How can these events be reconciled? On the one hand prior vascular and renal disease, on the other apparent absence of previous disease, and yet in pregnancy the same clinical syndrome ultimately appears. It is impossible to interpret the final clinical picture as other than an effect of pregnancy, which in the 1 case aggravates and in the other initiates the process.

This discussion seems to have wandered from an attempt at classification, but it is designed to show that an ideal classification seems at present to be impossible. As an example, the advance of chronic nephritis frequently, not always, is more vicious in pregnancy; the label "chronic nephritis in pregnancy" is incomplete. When hypertensive disease in the last trimester of pregnancy goes on to the preconvulsive state should the syndrome be set down as hypertensive disease or as the preconvulsive phase or preeclampsia, individually or as a combination. The preeclamptic picture probably results because hypertension was present, and it is this very picture that differs from the hypertensive disease prior to the pregnancy. These changes should be represented in a classification.

In considering the last aspect of the influence of nonpregnant disease on hypertensive-albuminuric pregnancy one must arbitrarily exclude hypertensive-albuminuric disturbances arising prior to the pregnancy. These excluded, is there evidence to support the thesis that hypertensive-albuminuric disturbances arise as the result of pregnancy? The preconvulsive and convulsive hypertensive-albuminuric syndromes have been discussed. Between the diseases acquired prior to pregnancy and the convulsive state of pregnancy there are many variations of hypertension-albuminuria and edema arising in pregnancy which demand clarification. The greatest number of cases consist of pure hypertension. This may arise at any time in pregnancy, generally occurs in the last part of the second or early in the third trimester and increases in severity as term is approached. The exception to this behavior is a sudden severe hypertension which persists in the absence of albumin and edema. This is similar in onset with many of the full blown preconvulsive or preeclamptic groups and is always a

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potential menace in the pregnancy. Until delivery has been effected a diagnosis cannot be made. Whereas in some the condition may clear at that time, other patients will persistently exhibit hypertension thereafter. I have followed a sufficient number of these patients to know that they fall into the hypertensive-vascular disease group in later life.

The classification of this type of case and similar examples of hypertension which appear and disappear with pregnancy has always been difficult. If the term "toxemia of pregnancy" is used in designating hypertensive-albuminuric pregnancy, these states unequivocally should be placed in such a category. Many examples of the preconvulsive state or preeclamptic state in pregnancy exhibit hypertension as the first manifestation; later edema, albumin and secondary features occur. If this syndrome is compared with the former, it is hard to avoid the many similarities. Until delivery has been effected convulsions must be feared, as the former state may merge into the latter. Similarly, until delivery has occurred classification cannot be established. One must conclude that two or more syndromes may arise as a result of pregnancy and terminate in a convulsive state, or that the many syndromes which arise as a result of pregnancy are identical fundamentally.

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PROTEINURIA IN TOXEMIA OF PREGNANCY

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Proteinuria or albuminuria in pregnant patients should always be regarded as evidence of some renal abnormality. It is one of the triad of signs (hypertension, albuminuria, edema) of preeclampsia, and the appearance of proteinuria should suggest the possibility of eclampsia developing. The appearance or increase of protein in the urine of patients with hypertensive disease or chronic glomerulonephritis should always suggest impending fetal death, which is usually due to well defined placental infarction, retroplacental hematoma or abruptio placentae.

Studies by Addis and his co-workers indicate that the urine of normal persons contains from 0.02 to 0.06 Gm. of protein in twenty-four hours. The constant excretion of larger amounts is abnormal.

Studies by Elden and Cooney, as well as by us, indicate that these amounts are unchanged during normal pregnancy.

Benign proteinuria does occur in a nonpregnant person, but a thorough examination of the renal function and urine must be made before the case is so diagnosed. We have a small number of patients who have had persistent proteinuria during pregnancy without any other manifestation of vascular or renal disease.

The following notes concerning 6 patients who had proteinuria before pregnancy with no obvious cause are of interest: One patient had a diagnosis made of physiologic albuminuria by the medical service in 1931, but since then she has had three toxemic pregnancies and now has persistent hypertension. Another had proteinuria in 1933 which was ascribed to dehydration from vomiting. The correct diagnosis at that time could have been established with an Addis count. The first and last pregnancy, in 1935, was complicated by hypertension of 220 systolic and 150 diastolic, hematuria and the other manifestations of recurrent acute glomerulonephritis. The patient did not return after 1938 and, in view of the severe hypertension and low renal function, has probably died. A third patient was eventually found to have a bilateral pyonephrosis due to ureteral strictures from nephrolithiasis. A fourth patient had the first pregnancy interrupted because of hypertension, but a subsequent pregnancy was uneventful. Her renal function is a low normal. The remaining 2 have had uneventful pregnancies and their renal function is a low normal. Obviously, proteinuria in both pregnant and nonpregnant patients must always be considered as due to a renal disorder.

Theobald reports protein in the urine in the following groups of normal persons: college girls 24 per cent, postoffice girls 17 per cent, charwomen 8 per cent and women medical students 54 per cent. He states that the possibility of contamination from a vaginal discharge rarely occurs. He presents no data for pregnancy but states that most antepartum clinics find that the incidence of proteinuria is very low in the first six months of pregnancy.

Baird catheterized 1,000 pregnant patients and found that 37 per cent had proteinuria. The incidence of proteinuria in our antepartum patients was 20 per cent. We have made more than 1,100 urea clearance examinations, mostly on patients who have or have had toxemia, and 45 per cent of the urines, which were all obtained by catheter, contained protein.

Eighty-two per cent of our toxemic patients had a 2 plus proteinuria for at least one day, or a 1 plus or more for at least three days. Ninety-five per cent of the patients with severe preeclampsia and 89 per cent of those with severe hypertensive disease had proteinuria.

Proteinuria usually occurs during labor, especially if the latter is long or the contractions are of long duration and frequent. The cause is the muscular exercise. Protein in large amounts can be found at times in the urine of patients who have had extensive hemorrhage, especially abruptio placentae. Infection in the urinary tract may also cause albuminuria.

The concentration of proteins in the urine ranges from a negligible amount up to a maximum of 5 per cent. As a rule, when the concentration exceeds 1 per cent the volume of urine is extremely small. The twenty-four hour excretion of protein in the urine usually ranges from 0.2 to 3 Gm. When the daily excretion exceeds 3 Gm. the duration is short because the clinical condition usually becomes so severe that intervention is necessary. A daily excretion of more than 5 Gm. of protein in the urine for ten days or more should suggest a nephritis or nephrosis, as such a large excretion rarely, if ever, occurs in preeclampsia.

Several studies have been made of the urinary albumin-globulin ratio. In patients with nephritis, the ratio is usually 6 or more to 1. Patients with eclampsia excrete a large amount of globulin, and the ratio is 2 or 3 to 1. In patients with nephrosis and nephritis, analysis of the urinary protein for cystine and tyrosine or analysis by electrophoresis indicates that in some

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patients the composition of the urinary protein is different from that usually found. In these patients the composition of the serum protein is also altered.

Chesley found that in chronic glomerulonephritis and in nephrosclerosis there was a constant filtration of protein. However, in preeclampsia and eclampsia the filtration of protein was extremely variable.

The protein in the urine is lost through the glomerulus, and in cases of renal disease in which many glomeruli are still functioning the concentration and twenty-four hour excretion of protein in the urine will be relatively large. However, as the number of functioning glomeruli grows less, the amount of protein in the urine decreases sharply, thus occasionally giving the impression that the kidney lesion is improving or has actually been cured, whereas if renal function tests are made decided impairment is usually found.

Kellogg in 1924 stated that there was some relation between proteinuria and abortion, stillbirth and abruptio placentae in hypertensive patients. He stressed the importance of proper diet and rest, together with the interruption of the pregnancy several weeks or months before term.

Young has presented data concerning the "toxemic sequence," that is repeated abortions and stillbirths associated with toxemia of pregnancy. According to him, the incidence of abortion, premature labor, abruptio placentae and stillbirth is 10 per cent in normal patients and 23 per cent after a toxemia. Fifteen per cent of the pregnancies in our clinic after nonconvulsive toxemia terminate without a living baby.

Gibberd has always emphasized the importance of proteinuria during pregnancy. He states that:

> If a patient with albuminuria is treated carefully over a long period, and induction of labor is performed just soon enough to avoid eclampsia, there is a tendency to regard such treatment as an obstetric triumph made possible by the great clinical acumen of the obstetrician. Actually, it is often a grave obstetric blunder in that as a result of the prolonged albuminuria an uncurable chronic nephritis may develop.

We do not agree with Gibberd that the cause of the chronic nephritis is the result of the prolonged proteinuria. We have evidence that patients who have persistent hypertension or albuminuria, or a recurrence of toxemia in a subsequent pregnancy, have a vascular disease as the basis and that they would have these conditions irrespective of the duration of the toxemia. We do not believe that true preeclampsia or eclampsia causes a permanent vascular or renal disorder.

Theobald suggests that the albumin associated with pregnancy could be accounted for by the lordosis, the diminished thoracic capacity associated with the latter months of pregnancy and the weight of the uterus. He thinks that albuminuria per se bears no relationship to the toxemia of pregnancy except that disturbances of metabolism and diet are factors in the causation of both conditions.

Krieger and Rome [1] studied the effect of a toxemic pregnancy in relation to subsequent pregnancies. They divided their patients into the following groups: (1) those suffering from albuminuria A, in which protein was observed in the urine for one day only; (2) those suffering from albuminuria B, in which albumin was observed in the urine for two to four days; (3) those suffering from albuminuria C, in which protein was present in the urine for longer than four days in the antepartum and postpartum periods and in which there frequently was hypertension and edema; (4) those suffering from typical preeclampsia associated with symptoms; (5) those suffering from chronic nephritis with evidence of permanent renal damage.

Krieger and Rome found that proteinuria of less than four days' duration has little if any effect on the pregnancy or on future pregnancies. However, if it persists longer than four days, the incidence of abortion, premature birth, stillbirth and toxemia increases sharply and the likelihood of these conditions recurring in a subsequent pregnancy is also sharply increased. From 20 to 30 per cent of the pregnancies resulted in abortion, 3 to 30 per cent of the babies were premature and 10 to 20 per cent were stillborn. From 35 to 40 per cent of the patients with severe toxemia had a recurrence in subsequent pregnancies. Sixty-four per cent of 651 pregnancies resulted in 418 living children.

We wished to determine the importance of proteinuria in toxemic patients. Patients with preeclampsia, hypertensive disease and chronic renal disease (glomerulonephritis or nephrosclerosis) were divided into groups according to table 1. Patients not at term who had constant proteinuria for two weeks and then had the pregnancy terminated were considered as having proteinuria for a period of more than four weeks. This grouping may and probably does account for some of the slight inconsistencies, especially in the group of patients with severe proteinuria for more than four weeks. Since the chief differences were found between the groups of slight and of severe proteinuria, the divisions according to the duration were omitted. Differences related to the duration of the albuminuria would have been more striking had we used a shorter period than two weeks. The comparisons are made primarily between slight proteinuria of two weeks or longer (preeclampsia and hypertensive disease) and severe proteinuria for two weeks or longer, a constant 2 plus and a 3 plus to 4 plus for at least one week.

TABLE 1.—*Distribution of Patients with Preclampsia, Hypertensive Disease and Chronic Renal Disease*

Amount of Proteinuria	Duration of Proteinuria
+ or ++ daily	2 to 4 weeks and over 4 weeks
++ constant and +++ or ++++ for at least 1 week	2 to 4 weeks and over 4 weeks

From 1931 to 1941 we have had 2,320 patients, or 8.6 per cent of all deliveries, with nonconvulsive toxemia of pregnancy. This study is based on 526 patients, which is 23 per cent of the toxemic patients and 1.94 per cent of the total deliveries. Fifty per cent had preeclampsia, 42 per cent had hypertensive disease and 8 per cent had chronic renal disease. Similar figures for all of our toxemic patients are 38, 53 and 5 per cent respectively.

The means for the ages are those usually reported: preeclampsia 27, hypertensive disease 30 and nephritis 31.

The preponderance of primiparas in the preeclamptic group is normal. The relatively high incidence of primiparas in the hypertensive "severe" group may be the result of faulty diagnosis (table 2).

Section B in the table contains data based on a history of previous abortions, stillbirths, premature

1. Krieger, V., and Rome, R.: M. J. Australia 1:597 (May 17) 1941.

deliveries and toxemia. The high incidence of 93 per cent in the patients with severe proteinuria and hypertension is worth noting. Likewise, the patients in both the mild and severe albuminuric groups with hypertension have an increased incidence of stillbirths and recurrent toxemia. These data bear out the well known belief of the increased fetal mortality in patients with recurrent toxemia.

TABLE 2.—*Data on Five Hundred and Twenty-Six Toxemic Patients*

	Proteinuria				
	Mild		Severe		
	Pre-eclampsia	Hypertensive Disease	Pre-eclampsia	Hypertensive Disease	Nephritis
A. Number of patients	144	136	117	87	42
Primiparas, per cent	67	17	79	36	31
B. History of previous abortions, per cent	44	44	39	77	50
History of previous stillbirths, per cent	4	12	1	16	26
Total fetal mortality, per cent	48	56	11	93	76
C. Blood pressure, mm. Hg					
Systolic, mean	161	176	169	186	193
Diastolic, mean	104	112	112	118	123
D. Edema, per cent					
Absent	13	9	18	8	9
+ or ++	85	80	76	87	86
+++ or ++++	2	11	6	5	5
E. Symptoms present, per cent	37	42	43	56	48
Retinal disease present, per cent	54	76	50	77	76

The means for the systolic and diastolic blood pressure are given for each group. The hypertensive and nephritic patients have a much higher mean than the patients with preeclampsia. These pressures are no higher than those found in patients without proteinuria.

From 80 to 85 per cent of the patients had 1 to 2 plus edema, approximately 10 per cent had no edema and the remainder had severe edema. We were surprised to find so high an incidence of edema in the hypertensive groups.

Thirty-one to 56 per cent of the patients had one or more of the symptoms associated with toxemia, headache being the most common. The tendency for the patient to have symptoms seems to parallel the amount and duration of the proteinuria.

The percentage of patients having abnormal retinal findings are given in section E. The hypertensive patients, as one would expect, have a higher percentage of retinal disease than the preeclamptic group. The amount and duration of the proteinuria bore no relation to the number of patients in the hypertensive group having retinal disease.

Data as to the management of the pregnancy are given in table 3. The high incidence of induction of labor and cesarean section is striking in all groups, but especially in the hypertensive and preeclamptic with severe albuminuria. These incidences are much higher in patients with proteinuria than in those without it. As would be expected, the morbidity of the toxemic patients is 23 per cent as compared with the average for the hospital of 7.9 per cent.

The distribution of weights of the fetuses are given in table 4. As the degree of proteinuria and severity of the condition increases, the number of fetuses weighing more than 2,500 Gm. decreases. The mean weights of the babies in the various groups are of interest. It is only in the group of patients with severe proteinuria and in the nephritic group that the mean weight of the baby is well below that of the average. Since the pregnancy of many of these patients was terminated before term, it might account for the decreased weight. However, the general experience is that in patients with persistent and severe albuminuria the birth weight of the fetus is always less than the normal for that period of pregnancy.

Table 4 contains data concerning fetal mortality. The incidence of stillbirths and neonatal deaths is much higher among the patients with severe albuminuria than those with a mild involvement. Even in the group with mild albuminuria the total fetal mortality is more than twice that of the whole hospital. If one compares the fetal mortality among patients having albuminuria with the total fetal mortality for all toxemic patients it becomes apparent that the major portion of fetal deaths occurs in those toxemic patients who have proteinuria of several weeks' duration. The patients with albuminuria lasting for two weeks or more comprise 23 per cent of all patients with nonconvulsive toxemia, but 37 per cent of the fetal deaths occurring in toxemic patients were found in the albuminuric group.

There are 5 patients with severe hypertensive disease among whom pregnancy occurred twenty times, with only four, or 20 per cent, living babies. These were delivered before term by cesarean section at thirty-two to thirty-six weeks' gestation. One patient with three pregnancies has had no living children.

The incidence of abruptio placentae in the preeclamptic group was 1.1 per cent, in the hypertensive group 5.4 and in the nephritic group 7 per cent. Sixteen per cent of the preeclamptic group and 22 per cent of the hypertensive group had well defined infarction of the placenta. Approximately 6 per cent of all patients were anemic.

The means for the serum protein concentration were calculated whenever there were at least fifteen determinations. In both hypertensive and preeclamptic groups the means varied from 6.3 to 6.6 before delivery and from 6.8 to 7.3 after delivery. The means for the urea clearances in the hypertensive groups were approximately 74 per cent both before and after delivery. These figures do not indicate any depletion of the serum protein concentration or any renal damage.

Approximately 50 per cent of the patients with hypertensive disease and 80 per cent of the patients with preeclampsia had a normal blood pressure on discharge from the hospital. Most of the patients in the hypertensive group had hypertension when seen three to six months post partum.

TABLE 3.—*Onset of Labor or Termination of Pregnancy*

	Proteinuria, per Cent				
	Mild		Severe		
	Pre-eclampsia	Hypertensive Disease	Pre-eclampsia	Hypertensive Disease	Nephritis
Spontaneous	74	49	46	44	17
Induction	15	25	38	33	19
Cesarean section	11	24	16	19	33
Hysterotomy	..	2	..	4	26
Therapeutic abortion	..	..	..	..	7

Peckham in 1933 attempted to correlate the fetal mortality with varying amounts of protein in the urine. The data in table 5 are based on Peckham's figures as well as on our own. It indicates a definite relationship between the number of abortions and fetal deaths and the increasing amounts of protein in the urine. We believe that the determination of the twenty-four hour excretion of protein in the urine is of far greater value than the determination of the concentration.

The data in table 6 illustrate the value of twenty-four hour determinations of protein and sodium chloride in the urine. Small amounts of protein cannot be detected with a qualitative test if the volume is large. Compare data for March 17, 19 and August 5, 18 and 20. The chloride determination reveals how well the patient is cooperating in her elimination of salt from the diet. The chloride and sodium intakes will usually be less than 1.5 and 0.8 Gm. respectively if the urinary chloride is less than 1.8 Gm. or less than 3 Gm. as sodium chloride in twenty-four hours. A sodium poor diet is of value if edema is present but of little or no value in the treatment of the hypertension.

TABLE 4.—*Fetal Weight and Mortality*

	Proteinuria				
	Mild		Severe		
	Pre-eclampsia	Hypertensive Disease	Pre-eclampsia	Hypertensive Disease	Nephritis
A					
0–999 Gm.	1	3	2	9	21
1,000–1,499 Gm.	...	2	8	10	12
1,500–2,499 Gm.	11	17	27	25	20
2,500+ Gm.	88	78	63	56	37
Mean weight, Gm.	3,190	3,150	2,730	2,485	1,975
B					
Stillborn, per cent	5	9	11	29	50
Neonatal deaths, per cent	2	7	4	6	5
Total fetal mortality—proteinuria, per cent	7	16	15	35	55
Total fetal mortality—all toxemic patients, per cent	6	7	17	27	48

Vascular and renal diseases are not the only causes of repeated abortion or stillbirths. One patient had a vaginal hysterotomy because of severe toxemia. There were two subsequent abortions attributable to the absence of the internal os. A repair of the cervix resulted in the birth of a live baby. Another patient with no evidence of vascular or renal disease had five pregnancies, all being breech or transverse position and all terminating in stillbirths. Examination revealed a bicornate uterus, with well developed horns but a comparatively little uterine body; thus the fetal head had to be in one horn and the breech in the other. The fetal deaths were due to the hazards of delivery. Syphilis is another cause of repeated stillbirths or premature deliveries. Hypertensive disease is no contraindication to antisyphilitic treatment.

All patients with persistent hypertension and/or proteinuria should have a thorough examination of the urinary system (microscope examination and renal function test as well as cultures of the urine, pyelograms and cystoscopic examinations in selected patients); ophthalmoscopic examination and an attempt to determine the etiology of the hypertension (blood pressor and depressor tests).

The causes of proteinuria have been enumerated. In preeclampsia and eclampsia the vascular spasms in the renal vessels are the cause. There is no evidence now available to account for the vascular spasms. Certainly the amount of proteinuria does not parallel the height of the blood pressure. The hypertensive patient will usually have albuminuria after the twenty-eighth week of pregnancy, when the blood pressure also begins to increase. The latter phenomenon is more likely to be the cause of the proteinuria than vice versa.

Our treatment is as follows: The fetuses of patients with prolonged proteinuria and especially of patients

TABLE 5.—*Abortions and Fetal Mortality (per Cent) and Proteinuria*

Proteinuria, Gm./100 Cc.	Abortions	Fatal Mortality	Total Mortality
None	2	4	6
Trace	1	7	8
Less than 1.9 Gm.	3	8	11
2–4.9 Gm.	4	15	19
5 Gm.	9	22	31

with hypertensive disease are always small for the period of gestation. If we see these patients in the first trimester intravenous injections of 500 cc. of a 20 per cent solution of dextrose are given three times daily for seven to ten days, in an endeavor to increase the size of the fetus and placenta. The patients are also urged to be constantly eating hard candy in an attempt to maintain a high blood sugar. In a small series this therapy has resulted in the birth of fetuses that were larger than previous ones.

The patients are told to rest in bed for ten hours at night and one hour in the morning and afternoon. These periods of rest are increased later in pregnancy. Phenobarbital or potassium bromide may be used as needed.

The diet should contain approximately 2,000 calories. It is adjusted so that the maximum weight gain is 7 to 8 Kg. for the whole pregnancy, by limitation primarily of the fats. The weight gain should be less than 225 Gm. (½ pound) a week. The protein intake should be 80 Gm. or more, derived chiefly from meat, milk and eggs. We have relied on the proper selection of foods for an adequate vitamin intake rather than on the ingestion of pure vitamins. Vitamin E or alpha

TABLE 6.—*Analysis of Twenty-Four Hour Urine*

Date	Volume, Cc.	Nonprotein Nitrogen, Gm.	Protein		Sodium Chloride, Gm.
			Qualitative	Grams	
3/17/41	2,700	17.2	0	0.3	14.7
3/19/41	1,200	16.1	+	0.2	12.5
4/27/41	3,100	16.5	0	0.3	12.6
7/29/41	2,400	13.7	0	0.2	12.3
8/ 5/41	2,900	12.1	+	1.8	3.2
8/12/41	2,600	11.4	++	2.9	2.5
8/16/41	2,100	12.9	+++	4.2	2.7
8/18/41	4,000	12.2	+	5.7	2.3
8/20/41	2,100	13.7	++++	9.2	1.9

tocopherol has not been of value in preventing fetal death from placental infarction or abruptio placentae.

The basal metabolic rate of patients with severe hypertensive disease is usually negative or even below normal and does not increase despite the stimulus from the pregnancy and thyroid medication. These patients take 0.06 to 0.2 Gm. of thyroid daily throughout the pregnancy.

If edema occurs, the diet must contain only a negligible amount of sodium and chloride. Salt or baking powder cannot be used in the preparation of foods or

the baking of bread and rolls. Salt-free butter is used. No crackers, pretzels, cheese, sausages, salted meats and fish, prepared salad dressings, canned soups, beer or "patent medicines" for the relief of gastric distress are permitted. There is a very low sodium content in flour, cream, macaroni, sugar, potatoes, squash, parsnips, lettuce, kidney beans, tomatoes and most vegetables and cereals. Eggs, meat, milk, beets, brussels sprouts, corn, mushrooms, peas and spinach are reasonably low in sodium content and may be consumed in moderate amounts. Boiling the meat will remove most of the sodium. The broth must be discarded.

Watch the water balance (weight). Ammonium chloride in 1 Gm. gelatin capsules is given eight times a day for five days and repeated after a five day interval. If symptoms of cardiac decompensation are present, the fluid intake is limited to 500 to 1,000 cc.

Oliguria or anuria is treated by the intravenous injection of 500 to 1,000 cc. of a 20 per cent solution of dextrose two or three times a day. Occasionally 500 to 800 cc. of a 30 per cent solution is necessary to produce diuresis. If there is cardiac decompensation, 100 to 200 cc. of a 50 per cent solution is used.

The general experience is that the loss of protein in the urine cannot be prevented by increasing the protein intake. If possible, it should be balanced. The determination of the twenty-four hour excretion is important for its prognostic value.

Cerebral, visual and gastrointestinal symptoms are treated by sedation, intravenous injections of dextrose solution and delivery.

Renal function tests are of little value in the preeclamptic patients but are of prognostic value in patients with other types of toxemia. Ophthalmoscopic examination is of value if pathologic changes are found, but normal conditions do not rule out the gravity of the toxemia.

Usually after several observations one is able to diagnose the toxemia as one of preeclampsia or hypertensive disease. Treatment depends in part on the diagnosis. If the diagnosis is preeclampsia, there is a possibility of eclampsia developing. If it is hypertensive or renal disease, eclampsia is not likely to occur, but there is a possibility of fetal death, especially after thirty weeks, because of placental infarction, retroplacental hematoma or abruptio placentae.

Since preeclampsia is caused by the pregnancy and since hypertensive and renal disease are usually made worse by pregnancy, it seems obvious that termination of the pregnancy may be necessary. The following criteria are indicative of severe toxemia. The patient must be carefully observed, and if labor does not ensue termination of the pregnancy is usually necessary.

Group A Criteria.—The systolic blood pressure is constantly 170 mm. of mercury or shows a persistent daily increase.

The proteinuria exceeds 5 Gm. in twenty-four hours or the qualitative test of the twenty-four hour urine is 3 plus.

The weight gain exceeds 100 Gm. a day.

Severe edema occurs suddenly.

Group B Criteria.—Cerebral, visual or gastrointestinal symptoms arise.

Oliguria, anuria or hematuria occurs.

Jaundice develops.

The blood nonprotein nitrogen is 50 mg. or more per hundred cubic centimeters.

The pulse rate is 120 or more.

Edema of the lungs or cyanosis is present.

The blood shows an increasing concentration, as indicated by an abnormally high or increasing hemoglobin, cell volume, serum protein concentration or specific gravity.

The advisability of terminating the pregnancy is dependent on the duration of the gestation, the severity of the symptoms and signs and the condition of the cervix.

Gestation of twenty-six weeks or less should be terminated if more than one of the criteria listed are present or if there is no appreciable improvement after seven days of adequate treatment.

Gestation of twenty-seven to thirty-one weeks should be treated medically until the thirty-second week, unless some B signs develop or the A signs persist despite treatment or increase in degree.

Gestation of thirty-two to forty weeks, if B signs are absent, should be treated medically until the cervix is "ripe," when induction of labor will be successful. If the A signs increase in degree or if any of the B signs appear, the pregnancy should be terminated either by (1) rupture of the membranes and/or insertion of a bag or (2) cesarean section if the cervix is uneffaced.

Our results indicate that the careful medical management of the toxemic patient, if begun early enough, will usually prevent further increase in the severity of the symptoms and signs until the cervix is "ripe." This means that the cervix is effaced and dilatable in the primipara or soft and partly dilated in the multipara, as determined by vaginal examination, and that labor can usually be successfully induced by rupture of the membranes.

The patient who does not respond to treatment or has been neglected is treated by rupture of the membranes and/or the insertion of a bag if the cervical canal is less than 2 cm. long, or if there is no effacement by cesarean section under local anesthesia.

There is general agreement that the severely affected preeclamptic patient with the various symptoms should be treated as if she had eclampsia, with great emphasis on immediate delivery, because the average maternal mortality for eclampsia is 13 per cent and for nonconvulsive toxemia 1.7 per cent.

Vascular collapse or shock may develop in patients with severe hypertensive disease either before delivery or within the first twenty-four hours post partum. Death may occur. If the condition occurs, the parturient canal must always be examined for a possible rupture with internal hemorrhage. Intravenous injections of 500 cc. of a 20 per cent solution of dextrose are of immediate value, to be followed by transfusions of serum or blood. Pressor drugs are also of value.

CONCLUSION

Proteinuria for a period of two weeks or more in hypertensive pregnant patients is accompanied by a sharp increase in the incidence of abortion, stillbirth and abruptio placentae.

Albuminuria per se is no indication for termination of the pregnancy. Other evidence of vascular or renal disorder must be present.

The total uncorrected fetal mortality among all of the patients with nonconvulsive toxemia was 11 per cent. Thirty-seven per cent of these fetal deaths occurred among the group of patients with proteinuria of at least two weeks' duration, who comprised only 23 per cent of all patients with toxemia.

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RELATIONSHIP OF THE HORMONES TO THE TOXEMIAS OF PREGNANCY

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The alterations that take place in the maternal physiology with the onset of pregnancy may be ascribed to one cause or to a combination of causes. The more important include the pressure effects of the enlarging abdominal mass, the changes produced on the maternal circulation by the development of the vascular system of the placenta, the demands made by the growing ovum and by the reproductive organs of the mother for nutritive materials and perhaps the need for disposal of certain waste products or antibodies produced in the developing fetus. Finally, there are the so-called sex hormones formed in the placenta which from a period early in pregnancy are found in the maternal body fluids in concentrations far above anything ever observed in the nonpregnant state.

Specific toxemia, or "hypertensive albuminuria," is a disease which apparently can develop only in women and only under the peculiar conditions of pregnancy. It is evident that any factor contributing to the development of what is characteristic of the physiology of pregnancy must receive at least passing consideration in the search for the cause of such a disease. Each of the factors listed in the foregoing paragraph has in fact at one time or another been held responsible. With the recognition of the effects of the sex steroids on extragenital functions, these hormones have received understandable attention in recent studies of the etiology of toxemia of pregnancy.

Two conceptions as to the exact relationship of the hormones to the development of toxemia of pregnancy appear to have emerged as a result. 1. According to one view, an abnormality in quantity or in the exact chemical nature of one of these hormones is present in the woman with toxemia of pregnancy. Such a conception implies a fairly direct causal relationship and holds out the possibility of a successful hormone therapy. 2. According to the second view, there is some other direct cause of the disease, but the placental hormones by the physiologic alterations they produce in the maternal organism greatly modify its course or clinical characteristics. The evidence for and against these two conceptions forms the essential material for this contribution to the symposium.

THE HORMONES OF PLACENTAL ORIGIN AS THE CAUSE OF TOXEMIA OF PREGNANCY

Quantitative studies on the serum and urine content of chorionic gonadotropic substance of estrogens and of pregnandiol have been reported from many laboratories in the last few years. Full agreement has not been arrived at, but the results begin to indicate certain probable trends. These may be briefly summarized as follows:

Chorionic gonadotropic substance is said to be elevated in the urine and the blood serum of patients with toxemia. A recent compilation of their work made by the Smiths[1] showed that in 67 cases of normal pregnancy there were no instances of elevated chorionic gonadotropin in the serum, while in 100 cases of preeclampsia and of eclampsia about 85 per cent presented abnormally high values. Although a few dissenting opinions have appeared, including a report by Browne, Henry and Venning,[2] and our own work at the New York University Medical College,[3] the majority of studies have tended to confirm the finding of an elevated chorionic gonadotropic substance in cases of toxemia.

The excretion of estrogens has been reported by several workers as being low in cases of severe toxemia, and with this finding we are in full agreement. Fractionation of the estrogens has led to the further observation[1] that in cases of toxemia there is an increased percentage of estrogenic activity accountable to estradiol, a decreased amount to estriol and a low or absent estrone content.

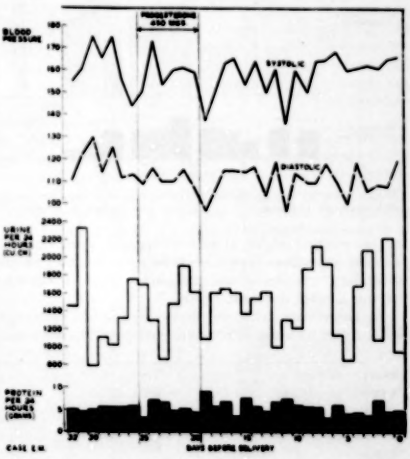

Chart 1.—Effect of progesterone therapy on blood pressure, urine volume and proteinuria in a patient with toxemia of pregnancy.

Pregnandiol, the excretion product of progesterone, is low in the urine of toxemia patients, according to a number of reports. This appears to be a fairly consistent finding, although exceptions certainly occur.[3]

The total excretion of androgens, or more strictly the 17-ketosteroids, appears from a few reported studies in the literature and some unpublished determinations of our own to be little changed by either pregnancy or toxemia. A few strikingly high values have, however, been recorded, but nothing has been done to discover whether the special compounds of the 17-ketosteroid group are abnormal in their quantitative relationships to each other.

Read before the Section on Obstetrics and Gynecology at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1942.

1. Smith, George Van S., and Smith, Olive Watkins: Estrogen and Progestin Metabolism in Pregnancy: II. The Endocrine Imbalance of Preeclampsia and Eclampsia: Summary of Findings to February, 1941, J. Clin. Endocrinol. **1**: 470 (June) 1941.

2. Browne, J. S. L.; Henry, J. S., and Venning, Eleanor H.: Urinary Excretion of Prolan, Estrin and Pregnandiol in Normal Pregnancy and in Early and Late Pregnancy Toxemias, J. Clin. Investigation **17**: 503 (July) 1938.

3. Taylor, H. C., Jr., and Scadron, E. N.: Hormone Factors in the Toxemias of Pregnancy, Am. J. Obst. & Gynec. **37**: 963 (June) 1939.

There is then in toxemia a tendency to low estrogen and pregnandiol excretion, probably a high chorionic gonadotropic content of serum and urine and certain changes in the relative amounts of the constituents of the estrogenic fractions. The essential question remains

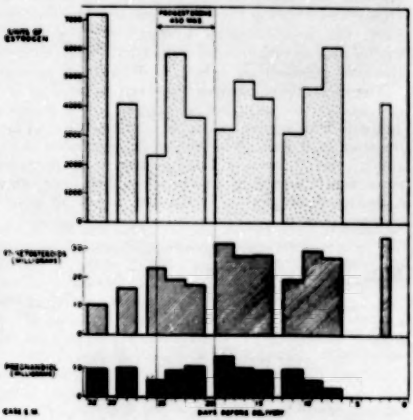

Chart 2.—Effect of progesterone therapy on excretion rates of estrogen, pregnandiol and 17-ketosteroids in a patient with toxemia of pregnancy.

as to whether these abnormalities are evidence of a specific causative hormone imbalance or are simply secondary manifestations, resulting from a disorder having a quite different cause.

In accordance with the first view, it has been suggested that toxemia of pregnancy is preceded by a progressive progesterone and estrogen deficiency, is closely associated with a rapid destruction of the estrogens and is perhaps due to some toxic product resulting from such destruction. The second view, it being recalled that these hormones are produced by the placenta and, in the case of the steroids, subjected to various chemical alterations in the liver, holds that the hormonal abnormalities in the urine are simply the result of the pathologic changes that are present in the placentas and livers of many preeclamptic patients. The evidence at hand does not permit the present exclusion of either hypothesis.

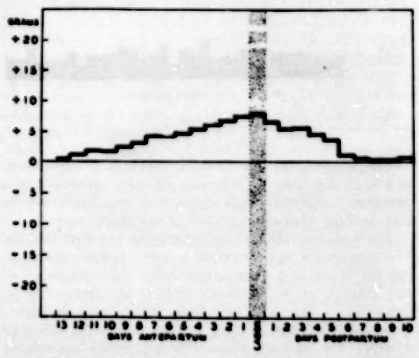

Chart 3.—The effect of parturition on sodium balance in normal pregnancy.

On the apparent assumption that the symptoms of toxemia of pregnancy are the direct result of a hormone deficiency, numerous attempts have been made to treat the disease by the administration of estrogens or progesterone. Promising results have been reported by White and Hunt.[4] The Smiths[5] speak of the preventive value of the hormones and report a temporary benefit in the treatment of some patients but on the whole are guarded in their conclusions.

Treatment of 9 patients with toxemia of pregnancy in the wards of Bellevue Hospital with large doses of progesterone, estradiol benzoate or a combination of these substances has not led us to believe that their administration has any specific effect on the course of the disease. The patients on whose course this opinion is based were all treated for at least one week by bed rest, sedatives and a restricted sodium and water intake before the endocrine therapy was commenced. Progesterone to amounts of 450 mg. and estradiol benzoate

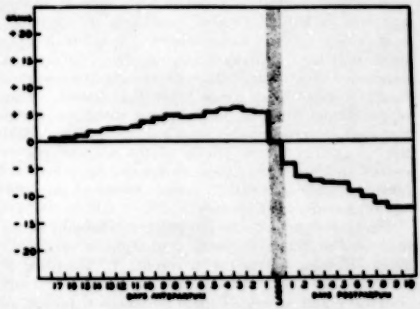

Chart 4.—The effect of parturition on sodium balance in toxemia of pregnancy.

in total doses of 180,000 rat units did not exert any evident effect, as indicated by blood pressure, weight change, daily urine volume or proteinuria. There was, furthermore, little evidence of a consistently altered rate of hormone excretion. The effect of treatment on 1 typical case is graphically shown in charts 1 and 2.

The least that can be said is that neither estrogen nor progesterone in any dose yet employed has shown itself as a specific in the alleviation of the toxic signs of preeclampsia. This fact is a small additional point against the direct causative relationship of a hormone imbalance to toxemia.

THE HORMONES OF PLACENTAL ORIGIN AS MODIFYING FACTORS IN THE CLINICAL PICTURE OF TOXEMIA

Without a disorder of the hormones being the immediate cause of toxemia of pregnancy, the possibility remains that these substances are important factors in the disease. A preexisting susceptibility to vascular or

4. White, Priscilla, and Hunt, Hazel: Prevention of Pregnancy Accidents in Diabetes, J. A. M. A. 115:2039 (Dec. 14) 1940.

5. Smith, George Van S., and Smith, Olive Watkins: Estrogen and Progestin Metabolism in Pregnancy: III. The Effect of Hormone Administration in Preeclampsia, J. Clin. Endocrinol. 2:477 (June) 1942.

renal disease, as has been alleged to be present in certain cases of toxemia, might become clinically evident under the hormone conditions of pregnancy. On the other hand, any renal or vascular disease as a result of the modifying action of the placental hormones might assume clinical characteristics during pregnancy quite different from those appearing in the same disease in the nonpregnant.

With these possibilities in mind, the particular aspects of the physiology of pregnancy attributable to the placental hormones must be separated from those due to other factors. In the investigation of these relationships the period from ten days before labor until ten days thereafter becomes important, because within this time occurs the enormous change from the high hormone concentrations of pregnancy to the low values of the puerperium. We have, therefore, devoted particular attention to the study of sodium balance and of renal function during the days before and after delivery, examining each in relation to normal and toxemic pregnancy and to the effects of the hormone withdrawal resulting from the loss of the placenta.

Sodium and Water Balance.—The edema of normal pregnant women, commonly evident in the swelling of

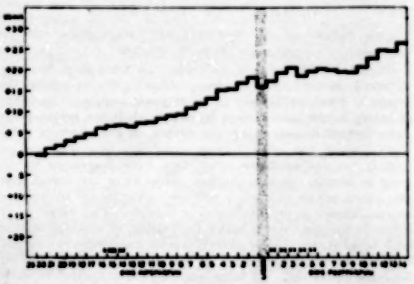

Chart 5.—The effect of parturition on sodium balance under postpartum estrogen administration.

the feet and ankles, is the clinical expression of a tendency to retain water and ultimately to a diminished capacity to excrete sodium. In cases of toxemia there is usually a further sodium and water retention and a greater degree of edema.

It has been shown experimentally that the administration of an estrogen or progesterone to laboratory animals is followed by retention of sodium, and the so-called menstrual edema of normal women has been attributed to these hormones.[6] On the basis of these observations it might be expected that the great concentrations of estrogen and progesterone found in normal pregnancy would be accompanied by an increased sodium and water retention and perhaps by mild edema.

In studies made by us [7] we have noted the following correlations between estrogen concentration and sodium balance (charts 3, 4, 5 and 6): In the normal puerperium there is a pronounced loss of sodium on the third, fourth and fifth days, the days when estrogen excretion is first at low levels. In 1 case in which the estrogen level fell with the death of the fetus several days before delivery the sodium balance became negative before delivery. In several cases the puerperal loss of sodium has been apparently prevented or reduced by

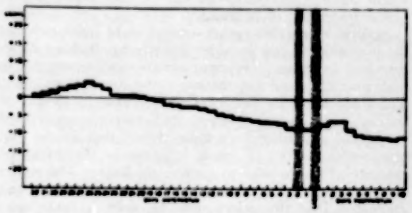

Chart 6.—The effect of parturition on sodium balance after antepartum fetal death.

the artificial administration of estrogens or progesterone during these days when the patient's own hormones are disappearing. In patients with toxemia the postpartum loss of sodium is of course usually much greater, and this cannot be prevented by any quantity of hormone which we have yet been able to administer.

On the basis of these studies it appears to us that the sodium and water retention of normal pregnancy is due largely to the steroid hormones manufactured by the placenta. It is doubtful whether the increased sodium retention of toxemia is simply an increase in this effect. On the other hand, the already present tendency of all

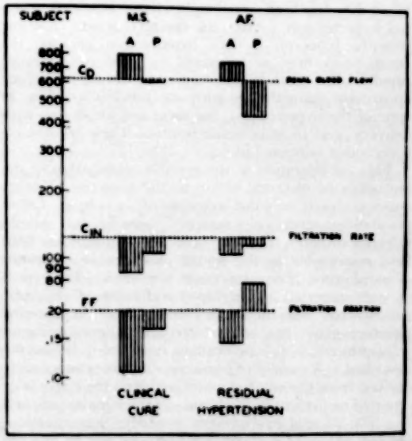

Chart 7.—The effect of parturition on renal function in two typical cases of toxemia of pregnancy, one with clinical cure and one with residual hypertension after delivery.

pregnant women to retain sodium and water as a result of estrogen and progesterone probably contributes to the edema of preeclampsia and perhaps even to the convulsions of eclampsia, if the latter are due to cerebral edema. In this indirect manner at least the placental hormones have a relationship to toxemia.

6. Thorn, G. W.; Nelson, Katherine R., and Thorn, Doris W.: A Study of the Mechanism of Edema Associated with Menstruation, Endocrinology **23**:155 (Feb.) 1939.

7. Taylor, H. C., Jr.; Warner, R. A., and Welsh, Catherine A.: The Relationship of the Estrogens and Other Placental Hormones to Sodium and Potassium Balance at the End of Pregnancy and in the Puerperium, Am. J. Obst. Gynecol. **38**:748 (Nov.) 1939.

Renal Function.—Clinical signs of disturbance in renal function in cases of toxemia consist in the proteinuria, the edema and the hypertension. In the majority of cases these signs disappear rapidly during the first days or weeks of the puerperium, changes which might again conceivably be due to the disappearance of the hormones of pregnancy.

Several recent laboratory studies have indicated that the hormones have a considerable effect on kidney structure and function. Hypophysectomy and castration in male animals cause a reduction in the size of the kidney. The male hormone produces an increase in weight of the rat and mouse kidney, and recent unpublished studies in our laboratory have shown that in the dog testosterone causes a great increase in the maximal capacity of the tubules to excrete diodrast. The action of estrogens is less definite, but Korenchevsky [8] has suggested that the effect may be even a toxic one. These investigations show at least that substances of the general class to which certain of the placental hormones belong do have an effect on the kidney.

In the last few years investigations have been made in several laboratories on renal function in normal and toxemic pregnancy by means of inulin and diodrast clearances which measure the glomerular filtration rate and the renal blood flow. Our own studies have paid particular attention to contrasting conditions immediately before and after delivery.[9] The glomerular filtration rate and renal blood flow appear normal in uncomplicated pregnancy and in a given individual are unaffected by the fall in hormone concentrations after delivery. In the presence of the hypertension of toxemia there was found before delivery a normal or even elevated blood flow—an unexpected finding since a reduced blood flow has been found to be characteristic of essential hypertension. After the delivery of such toxemic patients, however, if their hypertension persists, the renal blood flow as measured by diodrast clearance rapidly falls. Certain factors present during pregnancy apparently maintain an adequate renal blood flow in spite of the hypertension, but these are withdrawn with delivery, and renal ischemia results. These factors are conceivably hormonal in type.

This consideration of the possible relationship of the hormones of placental origin to the toxemias of pregnancy is clearly only the beginning of the subject. Other possibilities, previously reviewed,[3] can be only briefly referred to here. (*a*) The posterior pituitary has been held responsible as the source of excessive quantities of antidiuretic and vasopressor hormones. The report of such materials in the blood and urine of eclamptic patients has been much disputed. (*b*) The anterior pituitary gland has been studied in patients dying of eclampsia and histologic changes supposed to be specific described. A variety of hormone substances supposedly derived from the anterior pituitary gland have also been reported as present in the blood of preeclamptic patients. (*c*) The adrenal has received somewhat less attention, but low values of corticotropic hormone and an absence of the usual adrenal hypertrophy of pregnancy have led to the claim of a cortical deficiency in toxemia. Treatment of toxemia with cortical hormones has of course been tried. (*d*) A lowered basal metabolic rate has been observed in some cases of toxemia. This has led to a recent hypothesis that a relative hypothyroidism sets off a series of events beginning with hypocholesterinemia which, progressing through placental endarteritis, leads to placental infarcts and eclampsia.

8. Korenchevsky, V., and Rost, M. A.: Kidneys and Sex Hormones, Brit. M. J. 1:645 (April 20) 1940.

9. Taylor, H. C., Jr.; Wellen, Irwin, and Welsh, Catherine A.: Renal Function Studies in Normal Pregnancy and in Toxemia Based on Clearances of Inulin, Phenol Red and Diodrast, Am. J. Obst. & Gynec. 43:567 (April) 1942.

SUMMARY

To return to the hormones of placental origin and their relationship to toxemia, one may say the following in summary:

1. That these substances, which evidently play such a profound role in establishing what is characteristic of the physiology of pregnancy, should have an influence on a disease such as toxemia, which occurs only in pregnancy, seems almost certain.

2. That an imbalance between the estrogens, progesterone and chorionic gonadotropic substance or a toxic product of their disordered metabolism is a direct cause is not yet established.

3. That the physiologic effects of the presence of these hormones should modify the clinical picture of the disease, particularly as regards salt and water retention, and perhaps as regards certain aspects of kidney function, seems probable.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DR. TILLMAN, DRS. DIECKMANN AND KRAMER AND DR. TAYLOR

Dr. W. W. Herrick, New York: To what point have we advanced in our study of this problem? We recognize the results of renal insufficiency in the pregnant woman. The factor of safety in the kidney must be largely abolished before pregnancy brings disaster. We are agreed on the effect of polycystic kidney and other serious congenital anomalies and of pyelitis and pyelonephritis when these have progressed to the point of notable renal destruction. Most of us are agreed that the milder grades of pyelitis and pyelonephritis are of little or no consequence in the production of toxemia. The second great group of toxemias comes under the heading of vascular disease with hypertension. Most observers with experience are agreed that the effect of pregnancy in the woman with established hypertension is bad. In some quarters the statement is made that women with essential hypertension can safely undertake pregnancy. I believe this doctrine is dangerous and injudicious. While there are exceptions, it is the rule that the patient with established hypertension does badly in pregnancy. The third great group of toxemias, eclampsia and preeclampsia, is most difficult to orient in relation to vascular disease. It is my opinion that we pay too much attention to the convulsion. It is dramatic, it is arresting but it is not specific. It does not merit a separate classification. We see similar convulsions in nephritis, in vascular disease and in numerous other conditions. If I were to argue that eclampsia and preeclampsia have nothing to do with vascular disease, I would place emphasis on the peculiar pathologic changes of eclampsia. While it is true that in rare examples of hypertension and of hyperthyroidism one sees changes in the liver which are quite like those found in eclampsia, they are extremely uncommon. It is difficult to explain the peculiar pathologic changes in eclampsia on any basis other than that of a specific disease. The other features of eclampsia, however, the retinal picture, the hypertension, the albuminuria, the edema, certain cellular alterations in the kidneys and other organs, may be found in vascular disease at some stage. The foundation of future study of the toxemias as of vascular disease must be twofold. First, pathologic histology. It is disappointing that the more recent studies of the toxemias of pregnancy have paid so little attention to this phase of the subject. It should be possible to get adequate material for the comparative study of the pathologic tissue changes of vascular disease and of the so-called specific toxemias. The second basis of progress is physiology. At present advance in either problem—hypertension or toxemia of pregnancy—is arrested by the limitations of our knowledge of physiology.

DR. J. ISFRED HOFBAUER, Cincinnati: The profound constitutional transformation incident to gestation, particularly during its latter months, is the result of the hyperplasia and associated overactivity of the endocrine chain thyroid-adrenal cortex-pituitary, the adrenal changes representing the response to the pituitary (basophilic) stimulus. To these factors must be added the abundance in the blood of estrogenic and gonadotropic hormones and certain split products of proteins which in the aggregate act to effect inherent vascular hypertonus and augmented responsiveness to vasopressin. On two recent occasions attention was focused on the consistent occurrence in the normal placenta of remarkable quantities of acetylcholine as a potent vasodilator, through its restraining influence on the tone of the vascular musculature (*West. J. Surg.* **49**:615 [Nov.] 1941; *Cincinnati J. Med.* **23**:107 [May] 1942). During gestation a delicate vascular balance is thus maintained. Another phase of the subject concerns the actual demonstration of placental acetylcholine deficiency and low choline content of the blood in the late toxemia of pregnancy. Stated as succinctly as possible, dislocation of the equilibrium between blood pressure activating and restraining principles peculiar to normal gestation, with a resultant unopposed effect of vasopressin on the arterioles and on the hypothalamic nuclei, appears to constitute the real determinant in the pathogenesis of the disorder. This new concept is based on established facts and has the unqualified endorsement of preeminent American physiologists. For details and certain therapeutic implications, may I refer to my paper in the *American Journal of Obstetrics and Gynecology* (**26**:311 [Sept.] 1933) and the two other articles quoted.

DR. A. J. ROSGY, New York: The treatment of eclampsia still belongs in the domain of the art of medicine, not to the science of medicine. The most significant statement made by Dr. Tillman was that many women who suffer from hypertension during pregnancy develop circulatory symptoms in later life. I attended many school teachers at a time when a greater number of school teachers remained unmarried. I had the opportunity to observe many of these women, married and unmarried, of the same ages and social standing and strata. I observed that the same constitutional type that developed eclampsia or hypertension during pregnancy suffered from circulatory disturbance when unmarried and usually died in the sixth decade of life. I feel that the trained obstetrician can readily anticipate the type of person likely to develop toxemia during pregnancy. I do not know whether this is a universal experience, but I have found that a woman who is long necked and has a slightly enlarged thyroid seldom if ever gets eclampsia, but the woman whom we ordinarily classify as short necked, with wide pelvic bones, fat and chubby, is most likely to get some form of hypertension during pregnancy. These women have to be watched and carefully regulated. I have laid stress not so much on the hypertension or on the amount of albumin as on the constitutional reaction. A woman may have a blood pressure of 160 or 170, she may have a slight increase in albumin, but as long as she has no constitutional reaction such as loss of appetite, headache, itching of the skin or some slight epigastric pain that woman is not dangerously ill and I am willing to carry her along in her pregnancy. If, however, the constitutional reaction to hypertension—whether it is 140 or 160—is great, that woman may get a convulsion at any time and should be treated accordingly. I should like to ask Dr. Dieckmann why he performed twenty-four cesarean sections in cases of mild hypertension. It does seem to me that if a woman is suffering from only a mild hypertension the obstetrician has plenty of time to induce labor and that there is no necessity for doing a cesarean section.

DR. WILLIAM J. DIECKMANN, Chicago: Dr. Rongy questioned the incidence of 24 per cent delivery by cesarean section in the patients with slight proteinuria. Many of these patients had pronounced hypertension, retinal pathologic changes and impaired renal function without much evidence of proteinuria. In other words, the "slight" and "pronounced" in this series had no relation to the severity of the toxemia. Many patients have definite evidence of severe toxemia with little or no albumin in the urine.

CASUALTY ANESTHESIA IN ENGLAND

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During the past year I served as anesthetist with the American Hospital in Britain Ltd., a volunteer organization financed by the British War Relief Society and headed by Dr. Philip D. Wilson, surgeon in chief of the Hospital for Ruptured and Crippled. Eight months were spent in England, during which time there was an opportunity to observe the methods and agents used not only by the services but also by civilian agencies in the treatment of casualties from air raids and other manifestations of enemy action. While bomb injuries were numerous, quite a number of casualties were seen as a result of automobile and motorcycle accidents, for which the blackout was a contributing factor. There were also injuries from airplane crashes and the ordinary accidents suffered by troops in training. Gunshot wounds were comparatively rare.

To appreciate the place of anesthesia in casualty surgery it is necessary that one study the organization of the medical services set up to deal with air raid casualties and other emergencies. The patient is first seen at the first aid posts. These are established in locations convenient to main thoroughfares, are protected by sandbags and are prominently marked so that walking wounded can find them in the blackout. Most factories and stores have their own posts staffed by employees. The public ones are manned by volunteer workers, trained and supervised by a local physician, and receive casualties by stretcher from the scene of action. The stretcher parties are assisted by rescue squads, who have special equipment for digging into débris, moving and cutting beams and girders, and otherwise extricating victims who have been buried by falling buildings.

Little medical treatment is given at the first aid post. Diagnoses are made and the patients are classified as immediate or delayed. Temporary splints and dressings to fix fractures and control hemorrhage are applied and the patients moved immediately to casualty hospitals by motor ambulance. If the first aid post is destroyed or overwhelmed with work, mobile units operating from the hospitals are available to replace them.

The casualty hospitals are the usual civilian hospitals of the community, "cleared for action." All patients able to be moved are sent to the country, and no patients are accepted except in real emergencies. The top floors are evacuated, as they are most vulnerable, and operating theaters are set up in the basement protected by sand bags and with emergency water supplies and lighting equipment. Minor injuries are treated immediately and the patients evacuated to reception centers where they can be fed and housed temporarily. Air attack causes serious injuries, of which compound fractures and the "crush syndrome" are probably the most common. The mortality is high, over 40 per cent. Energetic treatment is required for shock. Special resuscitation wards are established where these cases can be segregated under the care of trained personnel. Clothes are removed, warmth is supplied by hot water bags and blankets, and the foot of the bed is raised on "shock blocks." Morphine is given freely.

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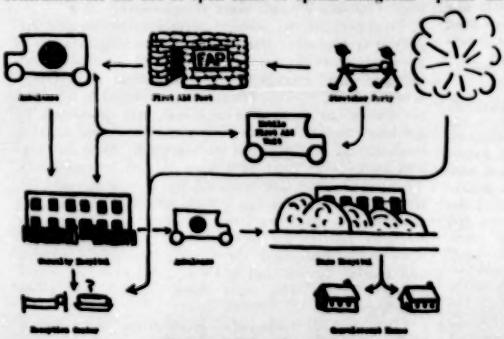
Oxygen, especially useful in the treatment of pulmonary edema subsequent to "blast," is administered by a simple flowmeter, bag and face mask apparatus. In some places the B. L. B. inhaler is used. There seemed to be an adequate supply of blood and natural plasma, constantly replenished from donor centers established in most of the larger cities. Plasma is used in the treatment of simple shock; hemorrhage is combated with blood transfusion. After shock has been treated, emergency surgery can be performed. Abdominal injuries are operated on as soon as possible. Nitrous oxide-oxygen supplemented with minimal ether is the commonest agent used, and a high degree of skill is necessary, for obviously many patients are still in poor condition from loss of blood and shock. Wounds and burns are débrided under general anesthesia. Intravenous pentothal sodium is commonly used for these cases; it may be supplemented with nitrous oxide if it appears that the duration of the operation may necessitate an unduly large dose. Shock is considered to contraindicate the use of open ether or spinal analgesia.



Treatment of air raid casualties.

The usual surgical team comprises an attending and a house surgeon, anesthetist, two nurses and two orderlies. If work is heavy it may be necessary for the anesthetist to supervise two or even three tables. They are set up side by side in the same room for greater convenience. The major work is done by the attending surgeon, who is on duty one day weekly, though if there is great pressure of work other men will turn out and help. The staff will usually stay on duty till all urgent cases have been dealt with. Sometimes this means over twenty-four hours' continuous work. The house men care for most of the minor cases and do much of the routine work.

The casualty hospital must concentrate on life saving measures and regard reconstructive surgery as of minor importance. Therefore patients are evacuated to the base hospitals in the country as soon as they can be moved, often only two or three days after operation. Beds must not be allowed to become filled or it would be impossible to accommodate an additional flood of casualties, and complete evacuation might be necessary at any time because of fire or severe damage.

Most city hospitals have established annexes in the country to which patients are sent for safety and to provide a place where the training of students and nurses can continue. Some famous London institutions have had to abandon their buildings in the city completely but are thus able to preserve their organization for activity after the war. These base hospitals have been set up in large houses, mental institutions and some new "hut" hospitals. The ideal base hospital is completely equipped for all types of cases, with emphasis on reconstructive surgery. Besides general surgical services there may be special units for chest surgery, brain surgery, orthopedics, peripheral nerve and facio-maxillary surgery.

The government considers that the civilian casualties from enemy action are entitled to as good treatment as the armed forces and for this purpose has established the Emergency Medical Service under the Ministry of Health. Many of the base hospitals are administered by this service and have a full time staff of attending physicians and surgeons, specialists and house men. An attempt is made to have the staff drawn from the city hospital, from which most of the cases are sent so that there may be continuity of treatment. Service cases are admitted to the base hospital from ships, naval hospitals and camp first aid stations. They receive the same treatment as the civilians. As a matter of fact, the methods used by the Emergency Medical Service do not differ essentially from those employed by the Royal Army Medical Corps or the Naval Medical Department. The Royal Air Force, on the other hand, treats its own personnel.

The American Hospital in Britain was assigned to work at Park Prewett Hospital in Hampshire. It is the base hospital for a sector comprising the cities of Portsmouth and Southampton and southwestern London, and most of our casualties came from these urban areas. It is a huge rambling affair, formerly a mental hospital, consisting of some thirty-five two story brick buildings connected by roof but not walled passages. Each building accommodates about 50 patients in large wards.

In addition to three general surgical services, there were special plastic and orthopedic units. Each service has its own wards, house staff and operating theater and anesthetist. In addition there were two part time anesthetists for relief; the house surgeons did many of the more minor cases, for a great many anesthetics were given for changing casts and painful dressings.

A typical service would have six wards and an operating theater. This was a large, windowless, octagonal room that had been used for hydrotherapy. It had tiled walls and linoleum on the floor. The baths and showers had been removed and modern sterilizing and operating room equipment installed. There was a mobile x-ray machine and an adjacent dark room. The theater was piped for nitrous oxide and oxygen under low pressure, and a crane hinged to the wall carried the tubing containing the gases over the heads of nurses and orderlies right to the gas apparatus. Quite a wide range of movement was allowed.

There were two Boyle's machines in each operating theater so that one anesthetist might supervise two tables should that need arise. These are much like Foregger's except for dry flowmeters. These are of two types: The Coxeter, with a vertical cylindric perforated tube in which a rather closely fitting float rises in proportion to the gas flow, the gas escaping through holes below the float. This type of meter is not capable of sufficiently fine adjustment for accurate basal oxy-

gen flow and makes the carbon dioxide absorption technic difficult. The other type, the Rotometer, has a tube tapering toward the lower end. The float is held in suspension by the gas which escapes around it, the height being proportional to the flow.

Most machines had no carbon dioxide absorber, a rebreathing bag being mounted on the head of the apparatus. When an absorber was supplied, it was of the circuit type with by-pass. The gases were led in at the mask. The whole apparatus was mounted on a table, on which there were yokes so that small cylinders could be used in an emergency, or to supplement the larger ones on the piping system.

Ether is vaporized by various methods. The gases may be bubbled through the ether. A wick type vaporizer, similar to that used on American apparatus, is supplied with the carbon dioxide absorber. Or the gases may be passed into the ether chamber through a U shaped tube, the open end of which is covered by a movable cylinder. Depressing this cylinder forces the gases to travel through more ether before escaping and thus increases the concentration. Drip attachments with sight feed are also used. Many vaporizers have water jackets to improve their efficiency. A chloroform bottle is supplied, the gases being bubbled through the liquid.

Gas is plentiful, though there is often some delay in filling orders because of transportation difficulties. There is also a shortage of cylinders, especially the smaller sizes, as no new ones are being made, and many were said to have been lost at Dunkirk. Cyclopropane or ethylene is not supplied by the government. The former can be obtained though the cost is high. Supplies must be ordered well in advance of requirements.

Intravenous pentothal sodium is a favorite anesthetic for minor cases and has practically replaced evipal, which at one time enjoyed great popularity in England. Pentothal is also being used for more prolonged operations, such as brain surgery, and a number of ingenious devices have been made for the prolonged and continuous administration of this drug.[1]

Adriani[2] has suggested that there are theoretical objections to the administration of pentothal sodium when the patient has been taking sulfanilamide and related drugs. Sulfanilamide was given very extensively, both locally and by mouth, and it would have been almost impossible to use pentothal had it been limited to untreated cases. Pentothal was used freely in spite of this medication without harmful effects, and it is suggested that these dangers are exaggerated. Nitrous oxide plus ether was the most popular anesthesia for routine major surgery, although sometimes nitrous oxide was reinforced with chloroform, and even both chloroform and ether were used. Open ether was very seldom seen, though sometimes it was used to maintain anesthesia after induction had been carried out with Clover's inhaler or, more rarely, ethyl chloride. Spinal analgesia was seldom employed. When used the favorite drug seemed to be light percaine (nupercaine) in 1:1,500 solution, the technic that of Howard Jones.[3] Local or regional blocks were very rare.

Endotracheal tubes were passed in most abdominal cases. It gives one a great feeling of security to know that respiratory obstruction cannot occur when supervising two or more anesthetics at the same time. Magill's tubes were used, passed through the nose, the larynx being exposed with Magill's laryngoscope, a conventional U shaped instrument. Magill's forceps was usually used to insert the tube. The throat was usually packed with gauze, as the use of a cuffed tube through the nose presents difficulties. In many cases 1 per cent percaine (nupercaine) in petrolatum was used as a lubricant to the catheter. It was felt that the local anesthetic effect was valuable, as it permitted very light anesthesia without coughing.

General anesthesia was used for plastic surgery, and endotracheal methods were essential. Intubation was usually done through the mouth unless that was the seat of operation. These operations were often quite prolonged, but light anesthesia and the carbon dioxide absorption technic minimized the amount of ether used and recovery was usually prompt. The line of incision was infiltrated with a dilute epinephrine solution to diminish hemorrhage, which is annoying when one is doing fine work.

Chest surgery is done by special teams which may be stationed at a base hospital, or may be mobile, traveling about as needed from hospital to hospital. An effort is made to have these units attend all major chest cases. Cyclopropane is supplied for anesthesia; the technic used has been described in detail by Nosworthy,[4] anesthetist to a mobile chest unit.

Anesthesia for major neurologic surgery varied somewhat in different clinics. The methods that seemed to be most popular were either tribromethanol in amylene hydrate supplemented with endotracheal nitrous oxide-oxygen and ether, or local infiltration plus intravenous pentothal sodium. The volume of cranial surgery was said to be much less than during the last war.

The medical situation seems to be well in hand at the present time. Certainly there is no shortage of doctors, though they may be distributed badly. No doubt some physicians are overworked in areas that are overcrowded with many evacuees. On the other hand, doctors in the larger cities from which many people have been moved often have little to do. This is particularly true of London, where the fashionable Harley Street practitioner has suffered severely, and numbers have been glad to accept salaried positions with the Emergency Medical Service. The amount of work thrown on the medical profession as a result of the war has been much less than anticipated. Epidemics were foreseen as the result of the disruption of sanitary facilities and overcrowding in air raid shelters, but so far none have materialized. Casualties from enemy action, in the services and the civilian population, have been far less than expected and, owing to the improvement in shelters and air raid precautions generally, will probably not be any worse in the future. Many physicians have been taken into the army, but approximately half are engaged in administrative, clerical and office duties that could be done as well by nonmedical personnel. To me it seems as if the profession in Britain has risen to the occasion and has the situation well in hand.

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2. Adriani, John: Effects of Anesthetic Drugs upon Rats Treated with Sulfanilamide, J. Lab. & Clin. Med. 24:1066-1071 (July) 1939.

3. Jones, W. H.: Percaine, A New Regional and Spinal Analgesic, Proc. Roy. Soc. Med. 23:35-44 (May) 1930.

4. Nosworthy, M. D.: Anesthesia in Chest Surgery, with Special Reference to Controlled Respiration and Cyclopropane, Proc. Roy. Soc. Med. 34:479-506 (June) 1941.

ABSTRACT OF DISCUSSION

A. L. TYNES, Major, Medical Corps, Washington, D. C.: We are indebted to Dr. McCarthy for this paper describing his personal experiences in an English casualty hospital during the big blitz. He has given us an account of the types of anesthetics used and a clear picture of the medical organization set up to care for such air raid emergencies. It is interesting to note how closely the organization of these first aid posts and casualty stations follows that of our own army battalion aid stations, surgical hospitals and evacuation hospitals. I believe that intravenous anesthesia is playing an ever increasing role in war surgery. Several years ago while at Walter Reed Hospital I had the privilege of introducing intravenous pentothal sodium to the Army as an anesthetic agent. The Surgeon General now places such importance on this type of anesthesia for wartime use that a manual is being prepared for general distribution to all medical officers describing in detail its technic and limitations. I am surprised to hear Dr. McCarthy say that spinal anesthesia was seldom used. In our army we have come to rely more and more on this procedure, particularly for operations below the diaphragm. It is my belief that spinal and intravenous anesthesia will play the greatest role in pain relief for the American forces during this conflict. Many of you are wondering what opportunity the medical anesthetist will have to follow his specialty should he enter the United States Army. At present each army station and general hospital of 500 beds or more is training surgical teams to be organized into tactical units which will be sent overseas as rapidly as possible. I will cite the auxiliary surgical group. This group contains twenty-four surgical teams, six splint teams, six shock teams, six gas teams, four neurosurgical teams, four thoracic surgical teams, four plastic maxillofacial teams and four miscellaneous specialist teams. Each of the twenty-four surgical teams is made up of one surgeon, one assistant surgeon, one anesthetist, one scrub nurse and one surgical technician. The other teams are organized along similar lines. This auxiliary surgical group is only one of our many tactical medical organizations. The Army needs trained medical anesthestists, and whenever they are available every effort will be made to use them in this specialty.

DR. S. LEROY SAHLER, Rochester, N. Y.: I should like to mention a few points with regard to the technical problems of anesthesia and analgesia under war conditions. It seems to me that the first aid casualty station would be the one most important place for the use of common horse sense. A great many of the accident cases are similar to the week end auto and motorcycle accident cases that pour into our emergency department, and they are amenable to the same practical treatment. Perhaps the first aid post, which is mentioned in Dr. McCarthy's paper as a distributing center, would be the ideal place for administering the initial doses of morphine or other analgesics. Perhaps adequate instruction could enable the physician at the first aid post even to give intravenous morphine to the patient for quick prolonged analgesia. This would enable them to be moved to the casualty station or base hospital. In the prompt relief of pain, some of the basic causes of vasomotor changes might be eliminated and shock brought more rapidly under control. The handling of the casualty stations themselves seems to be well controlled and well organized for most efficient service. There is only one possible point for discussion in the handling of patients in these stations, and that is the use of nitrous oxide and ether for emergency operation. It is my firm belief that the lives of these critically ill patients would be less in jeopardy under proper cyclopropane anesthesia than under nitrous oxide. The high concentration of oxygen so necessary in proper handling of shock or borderline shock cases is impossible to maintain with nitrous oxide anesthesia, whereas with cyclopropane the forced concentration of oxygen is ideal for this purpose. Of course, I recognize that skilled observation is necessary to ward off the occasional profound postoperative "cyclo shock" syndrome that all of us have met. This, however, is well handled by proper use of intravenous fluids and by keeping in mind the fact that this form of shock frequently does not appear for as long as one hour postoperatively. The attendants should be instructed that a slow pulse rate does not mean that all is well but that the appearance of the patient is extremely important to watch. In all doubtful cases the blood pressure should be taken every half hour. I have frequently seen patients with a pulse rate under 80 and blood pressure at the same time under 70 and even as low as 50. If such conditions are allowed to continue, the patient in question would be even more difficult to bring back than the patient with compound fractures and "crush syndrome" shock in the beds on all sides of him. The anesthesia in the base hospitals seems to be very well handled, but my own feeling is that cyclopropane should be used more often than seems to be routine there.

DR. K. C. MCCARTHY, Toledo, Ohio: These methods were presented, not as recommendations, and not as an ideal setup for a casualty system, but simply as observations of the methods used in England, and no doubt they are susceptible to a considerable amount of improvement. They seemed to feel in England, though, that the use of spinal anesthesia in fresh cases, particularly those showing shock, was hazardous, and for that reason it wasn't recommended. The use of intravenous morphine at the first aid posts presents technical difficulties because most of the personnel in these posts aren't physicians; they are not capable of giving intravenous medication and they are supervised by a general practitioner who may not have the opportunity of acquiring proficiency in intravenous technic, especially when done under the circumstances in which he works. There are certain disadvantages to the use of cyclopropane in England. The government there feels that at the present time its use demands special knowledge which the average anesthetist does not have, and therefore it is not recommended for routine cases. Moreover, the price in England is about three times that in this country and it certainly seems expensive enough here.

ANTICIPATION IN THE INHERITANCE OF DIABETES

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AND
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The following lines are in Naunyn's [1] textbook on diabetes:

> Very interesting and instructive in its bearing on our conception of the hereditary transmission of the anlage is the fact that diabetes (in father and sons) can appear earlier in the sons than in the father. I have seen that once. . . . Quite similar cases are reported by Bence Jones,[2] Grube,[3] Niessen [4] (1865-1897). Niessen saw a child of 13 years after scarlatina that followed a typhus develop . . . diabetes and die of it a year later. The father, a chemist, often examined his own urine but found it always sugar free until five years later, when suddenly the disease also appeared in him. . . . The second case of Niessen's is entirely similar.

Extending these earlier observations, Woodyatt [5] has noted further that when diabetes occurs in three generations of a single family it may appear earlier in the second than in the first and earlier in the third than in the second, the same trend continuing through three generations; also that it can be exhibited to some extent as between older and younger members of a single generation.

When an inheritable character makes its appearance in one generation of a single family at a given age, in the following generation at an earlier age and so on, the phenomenon is known as anticipation. It is

1. Naunyn, Bernard: Der Diabetes Melitus, ed. 2, Vienna, Hölder, 1906, p. 96.
2. Jones, Henry Bence: M. Times & Gaz. 1:58, 1865.
3. Grube, cited from Naunyn.[1]
4. Niessen: Therapeut. Monatsch., 1897, cited from Naunyn.[1]
5. Woodyatt, R. T., in Cecil, R. L.: A Textbook of Medicine, ed. 5, Philadelphia, W. B. Saunders Company, 1940, p. 621; On the Theory of Diabetes, Gordon Wilson Lecture, Tr. Am. Climat. & Clin. A. 58, 1941; Chapter on Diabetes, in Preventive Medicine in Modern Practice, New York Acad. Med., New York, Paul B. Hoeber, 1942, p. 443.

said to occur in a number of pathologic and teratologic conditions. Davenport and Muncey,[6] in a study of its occurrence in Huntington's chorea, draw attention to possible sources of error in interpretations of data. However, comparisons of ages of onset in diabetes in different generations of single families leave no room for doubt that the phenomenon occurs in this disease. How often it occurs is another matter. Naunyn's allusion to having seen it only in a single case, and the few reports on the subject that he appears to have been able to find in the literature in 1906, might convey the impression that it was relatively rare. Our own observations have conveyed an opposite impression. It has seemed evident also, from case reports to be found in the literature, that many writers have recorded it although with a few exceptions (cf. Macklin[7]) without commenting on it. Apart from its importance from the point of view of the geneticist, it is also a matter of practical interest in the estimation of the chances that the disease will appear in as yet unaffected members of the families of diabetic persons. As we were not familiar with statistics that serve to settle the question, it seemed desirable to collect further data on the subject.

For this purpose we have studied one hundred families in each of which the disease has been known to occur in members of two or more generations and in which the ages of onset could be ascertained. With two or three exceptions the families studied have been those of patients who have come under our care in the Presbyterian Hospital. The ages of onset in the patients have been determined as closely as ordinary clinical methods permit. With the younger patients they are probably exact to within a year. With the older patients there were more chances of error, as the disease could have existed before it was discovered. For the ages of onset in relatives of patients we have depended largely on statements of others which appeared to be substantiated by sufficient evidence to warrant acceptance. When the disease has appeared in two or more members of the same generation the ages of onset have been averaged for that generation. In eighty-eight of the families the disease was observed in two generations, in eleven in three, in one in four. In thirteen of the total there was a history of diabetes on both sides of the family.

RESULTS

In 10 of 100 families studied anticipation was not observed. In 7 of these the reverse occurred, the diabetes appearing later in life in the following generations.

In 90 families the data as recorded showed anticipation in varying degrees. The differences between the ages of onset in two successive generations ran as follows:

No. of Families	Years
5	Less than 5
6	5-10
20	10-20
34	20-30
11	30-50

The differences of less than five years recorded in 5 cases are not beyond limits of possible error in determining actual ages of onset. The differences of five to ten years recorded in 6 others may also fall partly in the questionable zone. But the differences of ten to fifty years observed in 65 cases are beyond limits of probable or even possible error.

In 10 of 88 families that showed the disease in two generations the diabetes skipped one generation, occurring in the first and third generations. In these families the differences between the ages of onset in the first and third generations varied from twenty-five to sixty-five years.

In 3 of the 11 families that exhibited the disease in three generations it appeared in the first and second, skipped the third and reappeared in the fourth. In 1 of these families (case B-1) a father and son and a father's brother's son all developed the disease at about the same age and at about 45, so that there was no demonstrable anticipation in the second generation. In a numerously represented third generation there is no known diabetes, but a granddaughter of the father's brother's son (a great-grandniece of the first progenitor) has developed the disease at the age of 4. Comparing the ages of onset in the case of the child with that in her grandparent, there is an anticipation of some forty-one years (or of about twenty years per generation of family after the second). In this particular case the diabetes was discovered in the first progenitor in about 1891 and in the great-grand-niece in 1941, so that the trend was not discoverable for some fifty years, which raises the question as to how many of the 10 families of the present series that have failed to show it may do so later. In the other 2 families that showed the disease in the first, second and fourth generations the data are indefinite as to ages of onset in the second generation, but the disease appeared in the fourth generation (the third diabetic generation) at the ages of 3 and 5 respectively, forty and sixty-eight years earlier in life than in the first generation. The trend therefore proceeded at the rates of twenty and thirty-four years per generation. In the 8 families that showed the disease in three successive generations there are also instances in which anticipation was not exhibited in the second generation but was in the third.

In all the families that showed the trend as between two successive generations (either first and second or second and third or both) the average difference between the age of onset in the two generations was twenty years. In all those that showed it as between the first and third or second and fourth the average difference was forty-five years (or twenty-two and a half years per generation of family).

In 20 of the 100 families studied the disease appeared in one or more brothers, sisters or siblings of the patient. In 16 of these the age of onset was earlier in the younger members of these generations. In 6 of the families the situation was mixed, as in a case (M-1) in which the disease appeared in the eldest son of a diabetic father at the age of 5½, in a daughter three years younger at the age of 12, and in a second son ten years younger than the first at 4½. In this case the data are quite exact, because the urines of all the children were tested often at home for sufficient reasons and a difference of six months is probably beyond the limits or error. As between the first and the second son and as between the sister and the second son the trend is definite, but as between the first son and his younger sister the reverse occurred. It so happens that in this case the affected children were the first, third and fourth in a family of four. The second child, a girl a year younger than the first

6. Davenport, Charles B., and Muncey, Elizabeth B.: Huntington's Chorea in Relation to Heredity and Eugenics, Eugenics Record Office Bull. 17, 1916, p. 207.

7. Macklin, Madge T.: Inherited Anomalies of Metabolism: I. Diabetes Mellitus, J. Heredity 24:349-356, 1933.

child, is now 17 and not affected. She has passed the ages at which the disease developed in her elder brother, younger sister and younger brother by eleven and a half, five and twelve and a half years respectively. The question is whether she will develop the disease. From the study of the trend in general and in this particular family, the chances of her so doing would seem relatively slight (although the possibility remains, as even identical twins can develop the disease in different periods of life).

COMMENT

Evidence of the trend was definite beyond limits of probable error in determining actual ages of onset in 79, positive but less certain in 85 and suggestive in 90 of 100 families in which the disease occurred in two or more generations. In a number of families that exhibited the disease in three generations the trend was not observed as between the first and the second generation but was observed between the second and the third. As such families would be listed as negative before the appearance of the third generation, and as 88 of the 100 families showed the disease in only two generations, the possibility is suggested that anticipation may be the expression of an inherent potentiality that exists in all cases.

The observations have a bearing on our conception of the course of diabetes and of our understanding of differences in the character of the disease in older and younger subjects. In those families in which the trend appeared, the differences between the ages of onset in two successive generations (or in two with a skipped generation between divided by 2) varied widely in different individual cases, but the general average was twenty years. So in a given typical or composite case (essentially similar to some actual cases) the disease might appear in a first generation in the forties, fifties or later, in a second generation in the twenties, thirties or forties, in a third in the first or second decade. Thus a parent could be affected at the age, let us say, of 50 years, a child of the parent (or nephew or niece) at the age of 30, a grandchild (or sibling) at the age of 10. Or the parent could be affected at the age of 50 and a grandchild at 10 with no diabetes in the second generation. Then a continuance of the trend at the same average rate would bring the age of onset in a fourth generation to minus ten years or to whatever period this may imply in prenatal time. We might think perhaps of nonconception or of the development of the disease in intrauterine life with resultant death of the fetus. In any event, when last seen the trend is pointing in the direction of extinction of the strain (on one side of the family, if not on both).

This gives us the picture of diabetes appearing in a family (that has not exhibited it before so far as we know) and running a definable clinical course but in the family as distinguished from the individual case. The rapidity of the course is measured by the rate of anticipation, which may vary from 0 (or even a minus value) to fifty years or more as from one to the following generation. The whole course can be run in two generations, but it is more commonly completed in three or four and rarely in more. That is to say, we rarely find families with a history of diabetes in more than four generations. In this picture those patients that develop the disease in later life appear as cases of first or second generations. They are offshoots of a vine that has been affected for only a limited time—expressions of a young family diabetes. On the other hand, juvenile diabetic patients appear as cases of following generations. In families that show rapid anticipation they can be representatives of second generations but with average rates are more often of a third or fourth generation. They are shoots from a vine that has been diseased for a long time—expressions of an old family diabetes. Hence the differences in the average course of diabetes in older and younger subjects.

The foregoing raises the question as to how many of the juvenile diabetic patients encountered in practice (with no history of diabetes in preceding generations) are also in reality similar end results of anticipation. There is much to be said in favor of the view that most or all of them are. In the first place the phenomenon of anticipation can be observed only in those particular families that exhibit the disease in at least two generations. In the general run of hospital cases positive family histories are seldom obtainable in more than 20 per cent, and in a third of these the incidence may be in only one generation. So of all families of diabetic patients only a small minority (in our own material less than 10 per cent) could exhibit the phenomenon even if the potentiality existed in all. But in this minority group its incidence is so high as to show that the potentiality must be common if not universal. And when the trend does occur it leads inevitably to the appearance of the disease in early life. So it is logical to infer that many juvenile diabetic patients are produced in this way whether the family history shows it or not. And then the question arises as to whether any of them can be produced in any other way. In this connection there are strong arguments that favor the negative view.

There is no doubt of the inheritability of diabetes, and the evidence is strong at the present time that it is actually inherited (or susceptible of transmission) in every case. It is also obvious that in taking the family history of a child any positive evidence of diabetes in the family, if this exists, must be found either in members of the child's generation or in relatives of preceding generations. It cannot be found in following generations that have not yet appeared. As a matter of fact, the highest percentages of positive family histories of diabetes that have been obtained in any material are those obtained in families of diabetic children, as witness data of Joslin [8] showing diabetes in the families of 52 per cent of 151 diabetic children who had survived the disease for fifteen years in 1940, and the statement of White [9] that ". . . when these children were first seen 1 in 5 had a relative with the disease . . . after fifteen years every other 1 had 2 or more and . . . those of twenty years' duration nearly 3 out of 5." This exceptionally high incidence of diabetes in families of diabetic patients shows that a large proportion of all the children of this series were actually descendents of preceding diabetic generations, and the trebling of the incidence in twenty years suggests that more and more cases have appeared or have been discovered, partly perhaps in the same generation but mainly in preceding generations. Surely not more than a negligible part of it could be due to the appearance of the disease in following generations.

The observations are further of some practical interest in connection with estimations of the probabilities that the disease will appear in as yet unaffected relatives

8. Joslin, E. P., in The Treatment of Diabetes Mellitus, by Elliott P. Joslin with the cooperation of Howard F. Root, Priscilla White and Alexander Marble, ed. 7, Philadelphia, Lea & Febiger, 1940, p. 47.
9. White, Priscilla, in The Treatment of Diabetes Mellitus, p. 671.

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of diabetic patients. If the age of onset in a parent should be 40 years, a child of the parent (or nephew or niece) developing the disease would do so, in a large majority of cases, at an earlier age and, on the basis of averages found in this series, at about the age of 10. So if a child should be unaffected at the age of 10 the probability that he would later develop the disease would diminish with every passing year, until at the age of 40 it would become quite remote (although the possibility would still remain that in this particular family the anticipatory trend was not yet in operation). However, if 1 child should develop the disease, the age of onset in his case would afford an index of the critical period for his generation.

In that case a younger brother, sister or cousin of the affected child developing the disease would do so at a somewhat earlier age in a majority of cases (about 4 out of 5 on the basis of averages found in this series). But an older brother, sister or sibling developing the disease would be correspondingly more likely to do so at a somewhat later age. In their cases the chances of being affected would diminish only after they had passed the critical period for their generation. In a majority of cases the ages of onset in different representatives of the same generation of a given family fall within a span of ten to fifteen years (with notable exceptions in a minority group). Of pertinence here are data on variations of ages of onset in 2 affected members of pairs of twins. In Priscilla White's series of 48 cases of diabetes in twins there were 14 cases in which the disease occurred in both members of the pair. In 11 of these, or about 80 per cent, the ages of onset were 2-3, 5-8, 3-13, 9-12, 17-29, 47-52, 55-53, 56-63, 57-57, 60-62, 62-62 (greatest spread twelve years). The other 3 cases (20 per cent) showed greater variations, e. g. 35-60, 29-67, 19-67 (greatest spread forty-eight years). While we have no data on a long series of cases to show the exact proportion of families in which the ages of onset in one generation fall within a span of ten to fifteen years, our impression would be that the foregoing is a fair index of the general run.

The same principles that apply to the brothers, sisters or siblings of the child in question would also apply to older and younger brothers or sisters of the parent. Again, if diabetes appears in a child (of a family that has not exhibited the disease before) it may develop later in members of preceding generations. The probability that it will appear in the generation of the parent does not lessen until after the passage of ages twenty years greater than the age of onset in the child, and then but gradually for another decade. Again, if a parent developed the disease at 50 to 60, a grandchild who developed the disease at all would be more likely to do so in the first or second decade of life, and so on. It is hardly necessary to say that in estimating the chances of a given relative of a diabetic patient other factors besides anticipation require consideration, such as possible mendelian ratios, but that knowledge of the former is an added help.

In accordance with the view that diabetes is transmitted on mendelian lines as a recessive trait, if a father and mother are both diabetic (or potentially so) 100 per cent of the children should develop the disease if they live long enough; or if one parent is diabetic and the other a carrier, 50 per cent; if both are carriers, 25 per cent; if one is a carrier and the other normal, 0 per cent; but then all the children would be carriers capable of transmitting the disease. In this connection the foregoing discussion of anticipation raises the question as to the chances that a juvenile diabetic patient would run of producing a living child that would develop diabetes after birth. If the partner is also a juvenile diabetic patient it might seem that the probability would be most remote. If the partner is diabetic (or potentially diabetic) but of a first or second generation of his or her family, the situation might differ, as a child conceivably could represent a later generation of the partner's family. The question can be settled only with the accumulation of data on the incidence of the disease in progeny of persons who have had diabetes in childhood.

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IMPROVED LOCALIZATION AND TREATMENT OF RUPTURED INTERVERTEBRAL DISKS

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My purpose in this communication is twofold: to suggest (1) a method of localization of ruptured intervertebral disks and (2) an improved method of operative attack on the disks.

In previous communications I have emphasized the ease with which the diagnosis of a ruptured disk can be made solely from the patient's story of low backache plus sciatica, occurring in attacks, usually after a relatively trivial injury such as a lift, bend or strain. During the acute stages the pain in the back and the sciatica are usually intensified by coughing and sneezing. Although there may be sensory and motor loss from local pressure on the nerve, the only really valuable objective finding is a diminution or loss of an achilles reflex, and this occurs in only about half of the cases. The subjective story is therefore all important, and negative objective findings are of no concern. Moreover, this is one of the most common lesions in the field of surgery. In industrial work these patients are passed along as having neuroses. Since the diagnosis can be made with almost absolute accuracy by the clinical symptoms alone, lumbar punctures, injection of contrast mediums such as air, iodized poppyseed oil and thorotrast into the spine are entirely unnecessary. They are in fact strongly contraindicated, for the small disks do not show with any contrast mediums and if dependence is placed on their findings the patient is denied the operative treatment that provides the only cure. In the last 350 operations for ruptured disks I have failed to find the disk only once, a spinal cord tumor being the causative lesion.

In a recent publication the small so-called concealed disks were described. Clinically the signs and symptoms are precisely like the protruding disks and the treatment is the same. All of these would be missed by intraspinal injections of contrast mediums and they now outnumber the protruding disks 3 to 2. It is the failure to detect the concealed disks at operation that has cast so much discredit on this field, which is really one of almost absolute precision. They are less obtrusive at operation, but with a surgeon who is skilled in this type of operation their recognition is just as unequivocal as the larger ones. The difference in recognition is not unlike that of differentiating a small from a large carcinoma of the breast: to the expert one is just as definite as the other. There are only

three or four other lesions that can give symptoms fairly similar to a disk, i. e. backache and sciatica (in attacks): (1) tumors of the cauda equina, (2) congenitally defective fifth lumbar vertebra with destruction of the articular processes and (3) spondylolisthesis. All of these are relatively uncommon. The latter two can be differentiated by the x-ray plates. Spinal tumors will usually give some sensory or motor disturbances in addition, but they may not. However, the percentage of error from this source is so low (1:500 in my experience) that iodized oil injections to exclude them would be unwise.

Perhaps a fourth possibility of error should be mentioned: carcinoma invading the low retroperitoneal spaces. Here the pain does not occur in intermittent attacks and is not intensified by coughing and sneezing.

One of the most important contributions to this field has been the statistical studies of Love and Walsh, and of Spurling and Grantham, both publications appearing in the same journal (*Archives of Surgery*, 1940). Their observations came to the same conclusion: that 96 per cent of all ruptured disks were in the lumbar region, and 98 per cent of the lumbar disks were at the fourth and fifth. My studies entirely confirm their conclusion. Occasional disks are encountered at the second or third lumbar interspaces but the symptoms are sufficiently different (usually pain in the front of the leg or diminution of the patellar reflex) to suspect the lesion higher than the routine levels. In these cases iodized oil may be advisable for the exact determination of the level, although I now feel that the test to be described is adequate to make this determination.

With the standard pain in the lower lumbar region and down the hip and back of one or both legs, the affected disk is therefore nearly always at lumbar 4 or 5, and it has been necessary to explore only one or both of these disks to find it. Frequently the exploration of one interspace would disclose the disk, but at other times it would be necessary to explore the second when the first was negative. Frequently there is a lead, such as a reduced or absent achilles reflex, which points to the fifth, although it may also exist with one at the fourth. Also a narrowed disk may be evident in the roentgenogram. As a matter of fact the exploration of two interspaces is a minor matter since Love introduced his beautiful operative technic of exposing and removing many disks without sacrificing any bone. The disks can usually be explored after removing only the ligamentum flavum. At most only a bite of a lamina is necessary.

LOCALIZATION TEST

The following test provides greater precision in locating the disk without exploring it: When the unilateral exposure of the spine has been made, the cutaneous incision is perhaps 4 inches long and uncovers both the fourth and fifth laminae. A periosteal elevator pushes the spines of the fourth and fifth spinous processes downward, i. e. caudally, and determines the mobility of each vertebra. The disk will be where the greater movement is shown. This test is effective because the defective disk has weakened the spinal column locally and this in turn causes mobility. It is this free play at the disk that is responsible for the intensification of the pain by coughing and sneezing. If the patient can stiffen the back before the cough or sneeze, the pain will be ameliorated. If the third disk is suspected, the same free play of the spine can be elicited there and in a recent case was the means of establishing the site of the affected disk when there was another at the fourth. In 10 cases it has made possible the diagnosis of two disks—one at the fourth and the other at the fifth—a not uncommon finding. A corollary to this observation is also interesting. In 6 cases during the past year reexploration of the wound for recurring symptoms has shown that the site of the previous mobile disk from which a ruptured disk had been removed was then firm and free of movement three to six months later. In each instance the second disk was responsible for the symptoms. This test of spinal mobility is not absolute, occasionally the degree of mobility is not decisive, and at times a disk will heal and solidify the vertebrae, leaving the extruded cartilage encapsulated under and attached to the nerve. However, in over 85 per cent of the cases it will correctly determine the site of the lesion.

OPERATIVE TREATMENT

Heretofore the operative treatment of ruptured disks by most surgeons has been to remove protruding cartilage and as much more as can be pulled out of the depths of the necrotic interior of this disk. However, I have always insisted that the interior of the disk must be treated by breaking up the contents with the forceps. Otherwise recurrence will occur in a considerable percentage of cases. For the concealed disks in which but little cartilage can be extracted the interior of the disk has been broken up with forceps. The eventual cure has depended, therefore, on the subsequent extrusion of the necrotic contents through the opening. With few exceptions this treatment will effect a cure, but not infrequently the period of convalescence will be protracted over a period of two or three months.

In only 1 instance has there been an actual recurrence of the disk. However, in 5 cases in this series I have reopened the wound expecting a recurrence, but in each instance there was only the unhealed cavity in the disk, doubtless because the necrotic contents remained more or less attached and had not yet been extruded. These too must be considered recurrences. Two thoughts developed from these cases: (1) that a thorough removal of the necrotic contents would hasten the postoperative period of recovery and (2) that it was probably better to remove enough of the lining cartilage to bare the bone and permit granulations to fill the cavity. Since the introduction of this procedure three months ago the recovery has been consistently uneventful and it has not been necessary to reopen a wound. This applied to both the concealed and the protruding disks. It must be realized that in all cases the entire center and much of the periphery of the disks are destroyed. After the ligament covering the disk has been widely opened, the edges are cut downward with a narrow sharp periosteal elevator and the whole interior of the disk is thoroughly curetted and as much as possible removed. Many small and even large pieces of cartilage can be extruded after this debridement.

CONCERNING FUSION OPERATIONS

There are many surgeons—and I think in increasing numbers—who advise fusion (graft) operations on the spine to stabilize it afterward. When one considers the mobility induced by the defective disk, this is perhaps not an illogical assumption. But when one sees the firm union that eventually results after the disk has healed with fibrous tissue it is clear that a fusion

is entirely unnecessary. I therefore feel very strongly that fusion operations are inadvisable and unnecessary. Following a fusion operation the patient must be immobilized in a cast for approximately two months—a severe hardship and one that is unnecessary.

There are times when a congenitally defective fifth vertebra, with or without spondylolisthesis, may closely simulate a disk or may be associated with a disk. These patients are prepared for a possible fusion. If there is a defective disk the fusion is not done. If there is no concomitant disk the fusion is in order.

A word is perhaps in order about the abuse of fusion operations. All too frequently patients are fused with or without search for an offending disk. After prolonged hospitaliaztion the graft has accomplished little or nothing in relieving the patient's symptoms; removal of the graft and treatment of the disk must subsequently be done. A possible need for the fusion operation is based entirely on the x-ray findings; i. e., spondylolisthesis or a defective fifth lumbar vertebra. And with either of these conditions a defective disk may or may not be present. With such findings preparation for a fusion is made at the time of the operation and is carried out only when there is no disk. The orthopedic staff works in close affiliation with me in this problem, and in 4 such cases a fusion has been done. In 6 cases in which a doubt was entertained a disk was found and the fusion operation avoided. This is an important decision and all depends on the operator's skill in detecting defective disks. And again, it should be reemphasized that the concealed disks can easily be missed and with tragic results.

WHEN IS OPERATIVE TREATMENT FOR DEFECTIVE DISKS ADVISED?

In the final analysis the answer to this question is the amount of pain the patient suffers. Spontaneous cures of ruptured disks must be very uncommon. Remissions in symptoms are the rule, but throughout life the patient is subject to repeated attacks following slight strains on the spinal column—such as lifting, bending, twisting or slipping. This is one of the most common ailments and one of the most debilitating, one of the easiest to diagnose and to cure permanently and with no risk. Why then delay treatment? Moreover, there are very few sciaticas with low backache that are not due to defective disks. I feel very strongly that when a patient has enough pain to consult a physician he should be operated on. Without operation one's activities can continue only at a reduced pace and with the ever present dread of recurring attacks. In the acute attack, whether the first or subsequent ones, the pain, which is so often excruciating, can be stopped at once by the operation. Delay only means more suffering and subsequent attacks.

SUMMARY

The foregoing additions leave little to be added subsequently in making the diagnosis and treatment of defective lumbar intervertebral disks almost free of error, and with almost perfect results. Recurrence of a disk should be very rare when it has been properly treated. The diagnosis and localization of the affected disk are nearly absolute on the clinical story alone. Lumbar punctures and intraspinal injections of contrast mediums are unnecessary, and if dependence is placed on their findings the chances of correct diagnosis are greatly lessened.

A low backache plus sciatica down the back of the leg, intensified by coughing and sneezing, are almost pathognomonic of a defective lumbar disk. The operative treatment is absolutely safe and a cure is practically assured.

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Clinical Notes, Suggestions and New Instruments

PNEUMOCOCCUS (TYPE XXVIII) ENDOCARDITIS WITH RECOVERY

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Recovery from pneumococcic endocarditis is rare. We have been able to find only 2 previous reports of its occurrence. Preble [1] in 1904 reported 2 cases, 1 of which can be interpreted as pneumococcic bacteremia associated with lobar pneumonia occurring in a patient with antecedent rheumatic heart disease. His other case appears more genuine: A girl aged 18 years had severe chills and fever five days after recovery from pneumonia. Systolic and diastolic murmurs were then heard, the heart having previously been normal. Pneumococci were found on repeated blood smears and cultures. The temperature returned to normal after being elevated for six days, and the patient made a clinical recovery. The murmurs persisted. Embolic phenomena were not noted.

Laubry and Coffin [2] reported 1 case: A woman aged 56 had a prolonged febrile course and, during the course of her illness, a systolic mitral murmur developed. Two blood cultures showed growths of pneumococcus type II. A later culture, however, revealed paratyphoid B. There were no embolic phenomena. Recovery occurred after a protracted course. Therapy included the use of antipneumococcus serum.

REPORT OF CASE

History.—G. K., a youth aged 18, admitted to the medical wards of the Jewish Hospital, Dec. 18, 1941, complained of chills, fever, sweats and malaise of three weeks' duration. The patient had been well until Nov. 25, 1941 when, while at work as a painter, he noted chilliness, generalized aches and pains, malaise and sore throat. During the next few days he had severe chills followed by drenching sweats and high fever.

About two weeks before the onset of his present illness, the patient had noted an abscess in his left upper gum. One week later the abscess ruptured spontaneously and discharged purulent material. The site remained slightly tender thereafter. There had been no active manipulation of the abscess or the teeth.

In the past history it was noted that a left otitis media had occurred seven years previously. In November 1940 he was admitted to another hospital for an injury to his left eye. At that time his heart was normal in size and no murmurs were heard. There was no history of rheumatic fever, scarlet fever, chorea, tonsillitis, epistaxis or joint or growing pains. The family history was not significant. The patient had been employed as a painter for the past two years.

On Dec. 1, 1941 he was seen for the first time by one of us during a severe chill. The only positive conditions on physical examination were a loud harsh blowing systolic murmur at the apex of the heart transmitted to the axilla and injection of the pharynx and tonsillar area, with a few patches of white exudate of each tonsil. No medication was given during the next few days. Chills and fever occurred daily. The patient complained of generalized aches and pains. There was no evidence of any joint involvement. On December 4 the administration of sulfathiazole (1 Gm. four times a day) was

From the Medical Service of the Jewish Hospital.

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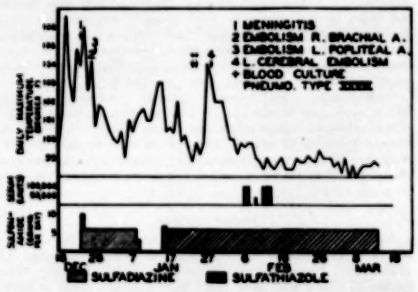
instituted with little effect on the patient's clinical signs or symptoms. On December 10, sulfadiazine (1 Gm. four times a day) was begun. On December 13 the patient complained of pain in the calf of the right leg. Examination at that time revealed only tenderness of the right calf. There was no discoloration, swelling or limitation of motion and no alteration of pulses in the extremity. The injection of the throat gradually subsided, the exudate disappearing. The murmur previously described persisted. Because of the persistence of the chills, fever and sweats, the intensity of the murmur and the possible embolism to his right leg, the patient was hospitalized with a tentative diagnosis of bacterial endocarditis.

Examination.—The patient was thin and on admission to the hospital did not appear in acute distress. His temperature was 99.8 F., the pulse rate 100 a minute and the respiratory rate 20 a minute. There was no dyspnea, cyanosis, jaundice or lymphadenopathy. No petechiae were visible. There was a scar on the left cornea extending from 10 o'clock on the limbus to the center, with anterior synechiae. The fundi were normal.

The tonsils were not enlarged and the pharynx was slightly injected. The oral hygiene was poor. Several teeth were missing and several others contained cavities. On the gum above the left lateral upper incisor was a small white spot which was slightly tender but from which nothing could be



Patient's course in the hospital.

expressed. The chest was clear. The heart was not enlarged and no thrill was felt. The rhythm was regular, the sounds being of good quality. A loud, rasping systolic murmur was heard at the apex and was transmitted toward the axilla. The second sound at the pulmonic area was accentuated and split. The blood pressure was 110 mm. of mercury systolic and 70 mm. of mercury diastolic.

The liver and spleen were not palpable. There was no tenderness of the costovertebral angle. Rectal examination was negative. There was no edema of the extremities. Pulsations in the dorsalis pedis and posterior tibial arteries were good and equal on the two sides. There was slight tenderness in the calf of the right leg. Neurologic examination was negative.

Course.—The course in the hospital is shown graphically in the chart. The day after admission the patient felt fairly well, his temperature reaching only 101.4 F. Laboratory studies revealed a normal urine, blood sugar, blood urea nitrogen and a negative Wassermann reaction of the blood. The blood count was hemoglobin (Sahli) 12.8 Gm. per hundred cubic centimeters (93 per cent), erythrocytes 4,600,000 per cubic millimeter and leukocytes 18,500 per cubic millimeter, with a differential count of 87 per cent neutrophils and 13 per cent lymphocytes. The blood sulfadiazine level was 2.72 mg. per hundred cubic centimeters. The blood sedimentation rate (Cutler) was 26 mm. in one hour. An electrocardiogram was normal. By roentgen examination the heart shadow and lung fields were normal.

On December 20 and once or twice daily thereafter, for about ten days, the patient experienced severe shaking chills, following which his temperature would rise to a peak of 102 to 106 F. He would then perspire profusely, with a concomitant fall in temperature. Blood cultures taken before and during the chills showed no growth.

On December 24 the patient complained of headache and a stiff neck. Nuchal rigidity was present and a positive Kernig sign was elicited. Examination of the ears, nose and throat was negative. No focal neurologic signs were present. Otherwise the examination was as noted on admission. Lumbar puncture revealed a cloudy spinal fluid under a pressure of 190 mm. of water. The fluid contained 18,000 leukocytes per cubic millimeter with a differential count of 95 per cent polymorphonuclears and 5 per cent lymphocytes. The chlorides were 700 mg. per hundred cubic centimeters, Fehling's solution was not reduced and the protein was 250 mg. per hundred cubic centimeters. No organisms were seen on smear and there was no growth on culture. Sulfadiazine was then given by mouth: 10 Gm. on December 24 and then 1 Gm. every four hours day and night. The symptoms and signs of the meningitis cleared rapidly during the next few days but the chills and fever persisted. The blood sulfadiazine concentration was maintained at about 10 mg. per hundred cubic centimeters. On December 26 the spinal fluid contained 900 cells per cubic millimeter with 80 per cent polymorphonuclears and 20 per cent lymphocytes. The chlorides were 650 mg., the sugar was 85 mg., and the proteins were 50 mg. per hundred cubic centimeters. The sulfadiazine level in the spinal fluid was 5 mg. A smear showed no organisms and cultures were again sterile.

On December 27 the patient complained of sudden pain in the upper inner portion of the right arm and of numbness and coldness of the right forearm and hand. On examination, the right forearm and hand were cold and mottled blue. There was tenderness in the upper inner portion of the right arm. No pulsation was felt in either the right radial or the brachial artery. A faint pulsation was felt in the right axillary artery. With the oscillometer, very slight oscillations of the needle were noted in the right upper extremity with normal oscillations on the left. Papaverine hydrochloride was administered in doses of ½ grain (0.032 Gm.), at first intravenously and then orally. Also the affected extremity was wrapped in lamb's wool and placed in a heat cradle. Following the institution of these measures, the pain diminished and the color and temperature improved.

The following morning, December 28, the patient complained of sudden pain in the calf of the left leg. The left foot was cold and blanched and there was tenderness in the upper portion of the calf. No pulsation could be felt in the left posterior tibial, dorsalis pedis or popliteal artery but there was good pulsation in the femoral artery. Oscillometric readings were zero below the knee, normal above. A paravertebral block with procaine hydrochloride at the level of the first, second and third lumbar vertebrae on the left was instituted, papaverine hydrochloride continued and heat applied.

On January 1, 1942 reappearance of pulsations was noted in the right brachial and radial arteries and the left posterior tibial artery. The pulsations gradually increased in strength, but the difference from those in the unaffected extremity could easily be detected.

The patient's temperature continued to range between 98 and 101 F. Subjectively he felt well. The heart remained normal in size and the murmur changed slightly with variations in the heart rate, but otherwise it was constant. No petechiae were noted. The spleen was not palpable. The leukocyte count remained about 10,000 per cubic millimeter. The erythrocytes gradually fell to 3,100,000 per cubic millimeter. Blood cultures, both aerobic and anaerobic, persistently failed to show growth even though observed up to sixteen days. Para-aminobenzoic acid was added to the mediums when the patient was receiving the sulfonamides. On January 5 the spinal fluid was clear, under normal pressure and contained no cells. The sulfadiazine concentration on that day was 4.6 mg. in the spinal fluid and 7 mg. in the blood. On January 5 and 7 the urine contained many red blood cells and on the latter date many crystals of sulfadiazine also. On January 8 the sulfadiazine was stopped, a total of 97 Gm. having been administered in the hospital.

The patient's temperature then gradually rose and on January 14 reached 103 F. The next day sulfathiazole was started with a dose of 2 Gm. and then 1 Gm. every four hours. His condition remained essentially unchanged, except for some lessening of his fever, until January 28 when a right hemiplegia suddenly developed involving the face and upper and lower extremities. There was a pronounced motor aphasia but consciousness was not lost. The next day, January 29, the blood culture taken on January 23 was reported as showing a growth of pneumococcus type XXVIII. The blood culture taken on January 24 was subsequently reported to show a growth of the same organism. Twenty cc. of blood was taken for each of these cultures ten minutes after the subcutaneous administration of 3 minims (0.2 cc.) of epinephrine. On smear of the colonies the organisms were gram-positive encapsulated diplococci. The cultures were bile soluble and on inulin produced both acid and a coagulum. Mice were readily killed after intraperitoneal injection of the cultures. The organisms in the peritoneal washings gave a prompt quellung reaction with type XXVIII pneumococcus serum.

On February 3 the peak of the patient's temperature was below 100 F. and after February 8 never rose above 99.4. Sulfathiazole 1 Gm. every four hours was continued. Between February 6 and 13, 540,000 units of type XXVIII antipneumococcus rabbit serum was administered intravenously (100,000 units each on February 6 and 7, 40,000 units on February 9 and 100,000 units each on February 11, 12 and 13). Intradermal and ophthalmic sensitivity tests were negative and the patient had very little reaction except for a moderately severe chill after the first dose. After February 6 the leukocyte count remained under 10,000 per cubic millimeter. The erythrocyte count gradually rose. The sedimentation rate, however, continued persistently rapid. The patient's murmur remained constant. He was alert although the aphasia persisted to a strong degree. Heat and massage were administered to the paralyzed limbs. He regained fair motion of the right lower extremity but very little of the right upper extremity. Spasticity, hyperactive reflexes and pathologic reflexes persisted in both.

On March 13 his leukocyte count was 7,000 per cubic millimeter and his erythrocyte count 4,300,000. Urinalyses were repeatedly negative. The blood sulfathiazole level had been maintained between 4 and 6 mg. per hundred cubic centimeters. Twenty blood cultures taken subsequent to the positive ones were all sterile.

On March 14, three months after admission, the patient was discharged from the hospital with a diagnosis of type XXVIII pneumococcus endocarditis with emboli to the meninges, right brachial artery, left popliteal artery and left middle cerebral artery.

Subsequent Course.—Since discharge the patient has shown gradual but steady improvement. Sulfathiazole was continued in gradually decreasing doses and was stopped on April 21. He is able to walk, but the leg is still somewhat spastic. There has been a slight improvement in the right arm. The aphasia is gradually diminishing. The murmur is still easily audible but appears not quite so rough or loud. There have been no further embolic phenomena. Pulsations in the vessels of the right arm and left leg are still noticeably diminished. His temperature, pulse rate, blood count, urinalysis and sedimentation rate are all normal. Several more blood cultures taken since his discharge have been sterile. The patient feels well and at present is attending a special school where reeducation is being attempted.

COMMENT

We feel that a diagnosis of type XXVIII pneumococcus endocarditis is justifiable on the following grounds: (1) the absence of a history of previous heart disease and the normal cardiac findings in another hospital a year prior to the onset of his present illness, (2) the septic course, (3) the type of murmur, (4) the embolic phenomena and (5) the recovery of type XXVIII pneumococci in two separate blood cultures.

The origin of the pneumococci is obscure; that the patient did not have pneumonia is definite. Other possibilities are the fistula over the left lateral upper incisor and the infected tonsils and pharynx.

We believe that recovery has occurred on the basis of (1) the return to normal of the temperature, leukocyte and erythrocyte counts; (2) the absence of further embolic phenomena; (3) the persistently negative blood cultures and (4) the pronounced improvement in the patient's general condition.

The relationship to recovery of the therapeutic agents employed is open to question. During the administration of sulfadiazine there was diminution in the chills and fever, which, however, recurred when the drug was discontinued. The embolic phenomena and the positive blood cultures were obtained during active treatment with sulfathiazole. Concomitant with the administration of type-specific rabbit antipneumococcus serum, in addition to the sulfathiazole, the temperature declined and recovery ensued. Whether the serum was instrumental in bringing about recovery or whether the administration was coincidental to spontaneous recovery is a moot point.

Old York and Tabor roads.

Special Article

HANDBOOK OF NUTRITION: IX

THE TRACE ELEMENTS IN NUTRITION

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AND
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These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—ED.

The many mineral elements which exist in animal tissues occur in widely varying amounts. They range from calcium, which comprises approximately 2 per cent of the adult human body weight and which can be expressed in kilograms, down to those which we must measure in milligrams and even micrograms, and which have been termed "trace elements." The dividing line between trace and non-trace elements is purely arbitrary and a matter of choice. Some nutritionists [1] include in the former category any element occurring in the tissues or nutritionally necessary in amounts equal to and less than iron, but others [2] consider only those elements below iron.

Presaging the point of view that traces of minerals might exert profound and specialized physiologic effects were the discoveries that iodine occurs in the thyroid,[3] copper in octopus blood [4] and in the hemocyanin of crustacea,[5] zinc in the hemosycotopin of oysters,[6] vanadium in the blood pigment of the sea squirt [7] and

From the Department of Biochemistry, School of Hygiene and Public Health, Johns Hopkins University.

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manganese in the blood of the mollusk Pinna squamosa.[8] Nevertheless, with the exceptions of iron and iodine little physiologic significance was attached to the others of the trace elements until comparatively recently. Beginning with the investigations on their distribution, especially those of Bertrand in France, the importance of the trace elements has come to be realized, primarily through the study of experimental animals on purified diets and through the work on diseases of live stock.

The importance of iron, copper and iodine, the trace elements first demonstrated to be essential, has been discussed in previous papers. Knowledge of the mode of action of these three elements and of those discussed here indicates that the role of "traces" is one of participation in the activities of hormones and enzymes, a role, in all probability, analogous to that of the vitamins. These elements are of importance nutritionally because optimum physiologic activity requires certain of them, at least, in proper amounts. Biologic relationships are such that lack of the essential "traces" results in deficiency symptoms, while excesses result in toxic symptoms.

To date at least twenty trace elements other than iron, copper and iodine have been reported to occur, many not consistently, in animal tissues and milk.[9] We shall discuss the elements which we consider of principal nutritional interest at this time, namely manganese, cobalt, zinc, fluorine, selenium, boron and aluminum.

MANGANESE

Conclusive evidence for the essential nature of manganese for animals was first demonstrated in 1931.[10] Although earlier investigators[11] claimed that they had shown this fact, their results were not conclusive.

Orent and McCollum[12] found that male rats reared from weaning on a diet adequate except for manganese developed sterility and testicular degeneration after ninety days. Females on the same diet delivered young which survived but a short while; in addition they failed to suckle normal stock young. Hemoglobin regeneration, estrus and growth were not affected by the deficiency.

When mice were reared on a manganese low diet consisting of whole milk supplemented with iron and copper, decreased growth and an abnormal estrus cycle resulted.[13]

Daniels and Everson[14] fed a manganese deficient mineralized milk diet to rats and confirmed the fact that the females produced nonviable young. However, their findings differed from those of Orent and McCollum[12] in that the deficient females suckled normal foster young.

Recently we[15] found that manganese is essential for the normal growth of the rat. The symptoms of deficiency in the female's production of nonviable young can be cured as well as prevented by manganese. In accord with the findings of Daniels and Everson[14] the deficient females, while losing their own young, could suckle normal foster young. The few young which did survive to weaning uniformly showed weakness and incoordination most pronounced in the third week of life, with poor growth and poor equilibration persisting throughout life. Manganese is needed for the proper development of other functions in addition to the reproductive. Boyer and co-workers[15a] have likewise found that manganese is essential for growth in the rat. Using a mineralized milk diet they observed the symptoms obtained in mice on a similar diet[13] and in addition, a marked delay in the opening of the vaginal orifice.

The differing findings of the Hopkins and Wisconsin workers on the reproductive ability of the deficient rats and mice is probably explained on the basis of differences in the magnesium content of the diets used. Purified diets have not yet been brought as low as whole milk in manganese content. If this is true, then different symptoms occur at different levels of intake. It is possible that unknown dietary relationships might also have caused the differences.

The species differences in deficiency symptoms and requirement, of which we are well aware in the case of the vitamins, extends to the trace elements. Investigations of manganese deficiency in chickens have resulted in knowledge of practical importance. The requirements of this species are much higher than those of any mammal studied and the most manifest symptoms are different. Manganese has been shown[16] to prevent the development of an osteodystrophy of chickens called perosis. The symptoms are enlargement of the tibial-metatarsal joint, twisting and bending of the distal end of the tibia and of the proximal end of the tarsometatarsus and slipping of the gastrocnemius tendon from its condyles, resulting in severe crippling. The deficient chicks have shortened leg bones[17] and vertebral columns.[18]

It has long been known that excess calcium and phosphorus in the diet intensify perosis and that injected manganese is more efficiently utilized than that given orally. In vitro and in vivo experiments[19] have helped explain these observations by showing that manganese

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is removed from solution by insoluble calcium phosphate or by ferric hydroxide and so rendered unavailable.

The chick embryo, like that of the rat, requires manganese for normal development. Lyons and Insko [20] observed a very low hatchability of eggs of deficient hens; the embryos which developed sufficiently were chondrodystrophic and the few which hatched also had shortened leg and wing bones (micromelia). Injection of manganese into the eggs prior to incubation resulted in normal development. Caskey and Norris [21] have observed an ataxia accompanying the micromelia.

The fact that only slight differences in manganese content are found between the decidedly different bones [19] and egg shells [22] of normal and manganese deficient chickens is indication that probably manganese plays some indirect or catalytic role in calcium and phosphorus metabolism. The possibility of manganese deficiency as a factor in producing bone abnormality in rats [23] and lameness in pigs [24] has been pointed out.

The specificity of manganese as the inorganic factor preventing perosis has been demonstrated.[25] However, the discovery that deficiencies of choline [26] and of biotin [26a] result in perosis in fowl is an indication that there are other factors necessary to prevent abnormal bone metabolism resulting in perosis. Perotic malformation may occur as a result of stress and strain on the retarded and abnormal bones of the deficient animal.[26b] It is suggested [26b] that the symptoms of "slipped epiphyses" in children [26c] resemble those of perosis. Biochemical and histologic comparisons of these bone abnormalities would be of interest.

A relationship between manganese and thiamine has been postulated.[27] Large amounts of thiamine or manganese given to rats caused reproduction and lactation failures which could be prevented by increasing the intake of the other of the two substances.[28] In addition, rats on a thiamine low diet receiving excess manganese were more quickly depleted than those not receiving it.[29] The implications of the work merit its being repeated.

That the need for manganese is widespread is indicated by the fact that, in addition to the animal species already discussed, it has been found essential for plants,[30] including fungi [31] and several bacteria.[32]

There is no definite information about the human requirements for manganese nor is there evidence of deficiency ever occurring in man. Everson and Daniels,[33] on the basis of balance studies, suggest that the diet of preschool age children should contain between 0.20 and 0.30 mg. of manganese per kilogram of body weight; retention in children 8 to 12 years of age was only 0.02 ± 0.22 mg. daily.[34] Approximately 4 mg. is found in the daily adult human diet [35] and substantially equivalent amounts are excreted. The manganese content of various foods has been determined, and it is apparent that plant foodstuffs are the chief source in the diet.[36] It occurs regularly in the tissues of animals, with liver containing the greatest amount.[37] There is a great rise in the percentage of manganese in the human fetal liver during the last months of pregnancy.[38]

After oral, subcutaneous or intraperitoneal administration, manganese is excreted almost entirely in the feces with only small amounts being excreted in the urine.[39]

After the necessity for copper as a complement to iron in hemoglobin formation had been established,[40] a controversy arose as to whether certain other elements could replace copper in this important function. Some investigators [41] have claimed that manganese could, but today the evidence to the contrary is quite conclusive.[42]

Acute and chronic manganese poisoning in man and experimental animals has been reviewed.[43]

Manganese and Enzyme Activity.—Since Bertrand in 1897 first implicated manganese [44] (erroneously, as we now know [45]) as the activator of the oxidase laccase;

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this element has been found to activate a number of enzymes.

Of particular interest is the observation of Wiese and his co-workers [46] that manganese deficient chicks with perosis have a lower blood and bone phosphatase activity than normal birds and that the decrease in phosphatase activity precedes the appearance of perotic symptoms. This decreased activity may be due not only to decreased manganese concentration but also to an actual decrease in the amount of enzyme present.[47]

In in vitro experiments manganese has been found to activate not only blood and bone phosphatases [47] but also the phosphatases in liver,[48] yeast,[49] intestine and kidney [50] and, although other divalent ions (magnesium, cobalt and iron) also activate phosphatases, they are not as effective in most cases as manganese.

Another enzyme with which manganese has been implicated is arginase, which is accepted as playing an important role in the formation of urea.[51] The strong activating effect of manganese on this enzyme led Edlbacher and Pinösch [52] to postulate that it is a protein-manganese complex. Richards and Hellerman [53] have given more definite evidence for the possibility that manganese is the physiologic activating ion, although cobalt and nickel can produce high activity in vitro. The evidence for the in vivo activity of manganese has been strengthened by the demonstration of a decrease in the arginase activity of manganese deficient rats.[53a]

Among the other enzymes whose activity increases with the addition of manganous ions are (*a*) phosphoglucomutase [54] (which causes a transfer of phosphate from carbon atom 1 of glucose-1-phosphate to carbon atom 6 in carbohydrate metabolism, (*b*) intestinal peptidases,[55] (*c*) cholinesterase,[56] (*d*) cozymase,[57] (*e*) isocitric dehydrogenase [58] (which catalyzes the reaction: isocitric acid to α ketoglutaric acid) and (*f*) yeast and animal carboxylase,[59] which contain diphosphothiamine. In yeast carboxylase, magnesium appears to be the naturally occurring activating ion, but in vitro manganese can quantitatively replace it. (*g*) The adenosinetriphosphatase activity of the muscle protein, myosin [59a] has been found to be activated strongly by calcium and manganese.[59b] All the enzymes listed are activated in vitro by one or more divalent ions in addition to manganese. The determination of the naturally activating metallic ion or ions and the manner of their action may be of value.

Rudra [60] has found the presence of manganese necessary for the in vitro and in vivo synthesis of a reducing substance, presumably ascorbic acid, by rats and guinea pigs and their tissues. As yet there are no reports of scorbutic symptoms in animals on manganese low diets.[61] Furthermore, it has been found that in manganese deficiency in the rat there is no lowering of the ascorbic acid content of various tissues;[53a] Rudra's findings were not substantiated.[53a]

COBALT

Our present knowledge of cobalt indicates that it is essential for at least several animal species and occurs in both plant and animal tissues in very small amounts.[62] Its distribution in animal tissues has been recently determined again by the use of the radioactive form [64] and confirmatory evidence obtained that it occurs in highest concentrations in glandular organs, especially the pancreas, liver, spleen and kidneys. Absorbed or injected cobalt, unlike manganese, is excreted in the urine, but the greater part of ingested cobalt is not absorbed.[63]

Bertrand,[66] on finding that the pancreas is relatively high in cobalt and nickel, suggested that these metals might be connected with the synthesis of insulin. He claimed a prolongation of insulin hypoglycemia on injection of cobalt; nickel had less effect. This effect of cobalt has not been confirmed.[67] Nickel has more recently been found to delay insulin hypoglycemia.[68] However, a number of metal salts have been found to influence the onset and extent of insulin hypoglycemia, notably zinc, so that such action is not specific.

A peculiar property of cobalt (in either metallic or ionic form) is its ability to produce a polycythemia when ingested or injected.[69] This cobalt polycythemia has been produced in rats, mice, guinea pigs, rabbits, dogs, pigs, chickens and frogs. Indicative of the small concentrations in which cobalt acts is the fact that 0.04 to 0.05 mg. in the entire body of a rat is sufficient to produce polycythemia.[70] It is a true polycythemia

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with an increased blood volume resulting from the increase in red blood cells and with little alteration in the total and differential leukocyte counts.[71] The action of cobalt appears to be on the erythropoietic centers, since hyperplasia[72] and stimulation of the erythrogenic precursors in the bone marrow[73] and an initial increase in reticulocytes[74] have been observed following its administration. The spleen plays no essential role in the phenomenon. The polycythemia has been maintained for months in dogs[75] and rats.[76]

Ascorbic acid can prevent or reduce the polycythemia of cobalt in rabbits[77] and dogs[78] but has no effect on that produced by anoxia.[75] Liver, choline and certain vasodilator drugs have also been found effective in reducing the level of cobalt polycythemia in dogs.[78] When fed to rats, liver did not reduce cobalt polycythemia but, on the contrary, increased it.[79]

The interesting observation has been made recently that the sulfur containing amino acids, methionine, cystine and cysteine, particularly the latter, prevent the toxic effects induced by cobalt and nickel administration.[79a]

Frost and his collaborators[80] have found that the polycythemia of adult dogs on a mineralized milk diet supplemented with cobalt is only temporary; in young dogs cobalt has more toxic effect with little influence on the blood picture. These investigators have made the interesting finding that an inhibition of the normal hemopoietic response to iron and copper resulted in dogs made anemic and fed cobalt prior to the administration of the iron and copper. Hemopoietic activity was dramatically resumed on the feeding of whole dry liver or liver extract. The factor or factors in liver causing this response have not been determined. These investigators suggest that, under the conditions of the experiment, cobalt feeding creates an unnaturally large demand for certain hemopoietic precursors. The possibility that liver contains something more than iron and copper which is intimately concerned with the stimulation of hemopoiesis recalls the finding of Filmer and Underwood[81] that the curative properties of whole liver in the treatment of enzootic marasmus (a cobalt deficiency disease in sheep and cattle) could not be accounted for on the basis of the cobalt content; they suggested at that time that liver provides some necessary organic factor for the elaboration of which cobalt is required.

Copper deficient rats fail to develop polycythemia when fed cobalt.[76] Schultze[82] has shown that cytochrome oxidase activity is diminished in copper deficient rats and fails to respond to cobalt alone, whereas the feeding of cobalt to animals receiving copper causes a rapid increase in the cytochrome oxidase activity in the bone marrow.

The knowledge that cobalt is a biologic essential is the result of research carried out in Australia and New Zealand. The story of this work has been reviewed in some detail recently;[83] consequently, only a brief summary is needed here.

In certain parts of the world cattle and sheep have been afflicted for long periods with a disease manifested by progressive emaciation and anemia. Western Australia has had its "Denmark disease" or enzootic marasmus, South Australia its "coast disease," New Zealand its "bush sickness," Scotland its "pine disease," Kenya its "nakruitis" and Florida its "salt sickness."

Deficiency of iron had been regarded as the cause of all these diseases for some years, but in 1933 this view was questioned because of the unevenness in response to various iron compounds. In addition, Underwood[84] in 1934 discovered that the livers and spleens of affected animals contained excessive amounts of iron, hardly a condition associated with deficient iron intake. The iron deficiency theory was completely discredited by Filmer and Underwood,[85] who demonstrated that by using an iron free extract of limonite, a hydrated ferric oxide used extensively in treatment, they could cure enzootic marasmus, implicating some contaminant of the iron compound as the curative factor. In 1935 Marston[86] and Lines[87] and almost simultaneously Underwood and Filmer[88] found that cobalt was the curative agent in "coast disease" and enzootic marasmus. Lines[87] and Marston[86] had been led to try cobalt through the Waltners'[89] work on cobalt polycythemia. In 1936 Askew and Dixon[90] in New Zealand found cobalt effective in the treatment of bush sickness. Cattle and sheep suffering from Florida salt sickness,[90] Kenya nakruitis[91] and Scotch pine sickness[92] have since been treated successfully with small amounts of cobalt. Certain areas of western Canada and of Michigan are now reported to have sheep suffering with

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cobalt deficiency.[93] The deficiency may be complicated by a lack of other elements. Salt sickness may be associated with an iron and copper deficiency, and there have been sporadic outbreaks in areas with coast disease of an ataxia in young lambs resulting from central nervous system degeneration which can be prevented by administration of copper.[94]

Demonstrating once more the quantitative or perhaps qualitative differences in requirement for trace elements that exist among different species is the fact that horses can remain healthy on cobalt low pastures on which sheep and cattle develop severe deficiency symptoms. Cobalt deficiency has as yet not been produced in rats even with daily intakes as low as 0.0006 mg. of cobalt;[95] this element may be essential to this species but in still smaller amounts.

The anemia that developed in rats on a whole milk diet responded no better to administration of iron, copper and cobalt than to iron and copper alone.[95] The results when dogs were used were not so simple;[96] in many cases iron and copper alone were able to cure the anemia produced by restriction to a whole milk diet or by hemorrhage, but, in about an equal number of dogs treated with iron and copper in which blood regeneration was unusually slow, small amounts of cobalt stimulated hemopoiesis.

The requirements for cobalt by man are unknown. The use of this element in the treatment of human anemia has been reported for children[97] with some favorable results and for adults[98] with negative results. The adult cases were very few in number. Waltner[99] has reported that in children, in contrast to experimental animals, cobalt administration results in an increase in the erythrocyte count but in no increase in hemoglobin.

Cobalt shares with manganese the ability to activate in vitro a number of enzymes.[100] It has not been implicated as the physiologic ion in any enzyme system.

ZINC

Although several of the earlier investigators[101] claimed to have shown the importance of zinc in nutrition, unequivocal proof for its necessity awaited the work of Todd, Elvehjem and Hart[102] in 1934. Using a diet containing only 1.6 parts per million of zinc, they found that the growth of the deficient rats was much inferior to the controls and that an alopecia developed over various parts of the body. With still more effective diets the Wisconsin investigators[103] have produced greater differences in growth and have again observed changes in the fur. The need for zinc in rats has been confirmed,[104] and it has been shown that mice require the element.[105] Microscopic study in instances of the deficiency[106] revealed extreme parakeratosis of the esophagus with a thick layer of partially keratinized cells; the skin showed hyperkeratinization, thickening of the epidermis and loss of hair follicles with persistence of the sebaceous glands. Several animals showed corneal vascularization similar to that described in riboflavin deficiency.[107]

The physiologic role of zinc has been under intensive investigation. Scott and Fisher[108] have reported its occurrence in insulin; this close association has been confirmed.[109] Zinc[68] (as well as some other elements[110]) reduces the severity of insulin hypoglycemia while prolonging it. Scott and Fisher[111] found that the average zinc content of the pancreas of diabetic patients was only half that of the nondiabetic, while the insulin content was only one fourth. However, a recent report[112] indicates that on a fat free weight basis the zinc content of the pancreases of the diabetic and the nondiabetic is the same.

Carbonic anhydrase, the enzyme which accelerates the reaction $H_2CO_3 \rightleftarrows CO_2 + H_2O$,[113] appears to be a zinc-protein compound,[114] although reports vary as to the zinc content.[115] It has been found in the blood, gastric mucosa,[116] pancreas[117] and renal cortex;[118] apparently all of the zinc in the erythrocytes is in this

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enzyme,[119] which, incidentally, is inhibited by sulfanilamide.[120] The enzyme uricase may also contain zinc.[121]

In view of these findings, it is interesting to note the observations on the physiology of zinc deficient animals. Thus far there have been found no disorder of carbohydrate metabolism,[122] no significant decrease in the carbonic anhydrase activity [123] and no decrease in the concentration of uricase.[124] On the other hand, the deficient rats showed a persistent rise in plasma uric acid,[124] a definite delay in intestinal absorption, particularly of nitrogenous products,[122] associated with decreases in pancreatic tryptic activity (nonspecific) and intestinal phosphatase activity.[125] Catalase activity in liver and kidney is decreased in zinc deficient mice.[105]

If its concentration in many tissues and foods is taken as the criterion, zinc should not be classified as a "trace" element if iron is not, since it occurs in amounts approximating those of iron; [126] in some cases zinc occurs in greater concentrations, milk, for example, containing 3 to 4 mg. per liter. The average daily diet contains 12 to 20 mg. of zinc, almost all being excreted in the urine. For the present there is no information on the zinc requirement of man. Several balance studies, one on children of preschool age [127] and the other on children 8 to 12 years old,[128] have shown zinc retention, indicating possible requirements. Scoular [127] tentatively recommends 0.307 mg. of zinc daily per kilogram of body weight for the preschool age child.

FLUORINE

The consideration of fluorine in any discussion of trace elements is pertinent for at least two reasons: first, because of the undesirable effects associated with widespread chronic fluorine intoxication, and, second, because of the recent interest in the effect of fluorine on the incidence and severity of dental caries.

Fluorine associated with various minerals is widely distributed in nature, especially in areas rich in phosphates, aluminum and volcanic ash. It is present normally in very small amounts in plant and animal tissues. McClure [129] has collected data on the fluorine content of foods and vegetables.

Water passing through fluorine rich mineral deposits becomes contaminated with the element, and consumption of this water during the period of tooth formation, particularly of the permanent teeth, results in a disease known as chronic endemic dental fluorosis, commonly called mottled enamel. Recognition that the disease is water borne came [130] in 1916, but it was not until 1931 that three independent investigations [131] implicated fluoride as the causative agent. Epidemiologic studies and animal experimentation fully support this view. Surveys of populations [132] indicate an orderly uniformity in the group response to the fluoride concentration of the communal water supply with regard both to the incidence and to the percentage distribution of the severity of the mottled enamel, particularly the latter, as shown in the table. Amounts of fluoride not exceeding one part per million of water are not considered of public health significance.[132]

The widespread occurrence of mottled enamel in the United States is indicated in figure 1. Its distribution is worldwide.

As fluorine acts during the period of calcification, the teeth of the affected child erupt, showing characteristic signs. Instead of having the normal smooth, lustrous, translucent appearance, the teeth have dull chalky white patches distributed over the surface, and in some cases the whole tooth surface may present a dead white unglazed appearance. In addition there

Relation of Fluoride Concentration to Incidence of Mottled Enamel in Children

(Nichols, M. S.,[132] from data of Dean and Elvove,[132a])

City and State	Fluoride Content in Parts per Million of Drinking Water	Composite of 9, 10 and 11 Year Old Children	
		Number of Children Examined	Incidence per 100 Children
Junction City, Kan.	0.7	115	1.7
East Moline, Ill.	1.5	110	24.5
Webster City, Iowa	1.6	72	38.4
Cloris, S. M.	2.2	138	71.0
Plainview, Texas	2.9	77	87.0
Amarillo, Texas	3.9	229	89.5
Conway, S. C.	4.0	59	88.1
Lubbock, Texas	4.4	164	97.6

may be discrete or confluent pitting of the enamel. The affected teeth often take on a characteristic brown stain, the frequency of occurrence increasing with age. Mottled enamel is a permanent disfigurement (figs. 2, 3, 4 and 5). The microscopic appearance is that of a hypoplasia of the enamel and dentin. There is a failure in the development of the cementing interprismatic substance of the enamel [133] with incomplete calcification of the enamel rods [134] and of the dentin.[135] Pitting is the result of the breaking off of the end of the enamel prisms.

The solution to the problem lies in the reduction of the fluoride intake by a change in the community water

119. Keilin and Mann.[103] Hove, Elvehjem and Hart.[103]

120. Mann, T., and Keilin, D.: Sulfanilamide as a Specific Inhibitor of Carbonic Anhydrase, Nature **146**: 164-165 (Aug. 3) 1940.

121. Holmberg, C. G.: Uricase Purification and Properties, Biochem. J. **32**: 1901-1906, 1939. Davidson, J. N.: The Purification of Uricase. 2. Some Properties of Purified Uricase, ibid. **36**: 252-258 (Feb.) 1942.

122. Hove, E.; Elvehjem, C. A., and Hart, E. B.: The Physiology of Zinc in the Nutrition of the Rat, Am. J. Physiol. **119**: 768-775 (Aug.) 1937.

123. Hove, Elvehjem and Hart.[103] Day and McCollum.[80]

124. Wachtel, L. W.; Hove, E.; Elvehjem, C. A., and Hart, E. B.: Blood Uric Acid and Liver Uricase of Zinc Deficient Rats on Various Diets, J. Biol. Chem. **138**: 361-368 (March) 1941.

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132. Dean, H. T., and Elvove, E.: Further Studies on the Minimal Threshold of Chronic Endemic Fluorosis, Pub. Health Rep. **50**: 1249-1264 (Sept. 10) 1937.

133. Black, G. V., in collaboration with McKay, F. S.: Mottled Teeth: An Endemic Developmental Imperfection of the Teeth, Heretofore Unknown in the Literature of Dentistry, Dent. Cosmos **58**: 129-156 (Feb.) 1916.

134. Williams, J. L.: Mottled Enamel and Other Studies of Normal and Pathological Conditions of This Tissue, J. Dent. Res. **5**: 117-195, (Sept.) 1923.

135. Beust, T. B.: A Contribution to the Etiology of Mottled Enamel, J. Am. Dent. A. **12**: 1059-1066 (Sept.) 1925. Ainsworth, N. J.: Mottled Teeth, Brit. Dent. J. **55**: 233-250, 274-276 (Sept.) 1933.

supply,[136] by dilution of high fluoride waters or by treatment of the water to remove the fluorides.[137] Various aspects of endemic dental fluorosis have been reviewed in a number of recent papers.[138]

Chronic fluorine poisoning may occur through exposure to dusts or fumes of fluoride containing minerals used in industrial processes. Roholm[139] in his monograph reviews the literature and discusses the poisoning of workers in Copenhagen factories where cryolite (Na_3AlF_6) was used in the production of aluminum. Gastric, intestinal, cardiac and respiratory disturbances were prominent, and osteosclerosis was the outstanding feature. All the bony system was affected eventually, but the vertebral column and pelvis were affected first and most severely. Greenwood[140] in his comprehensive review of the recent literature also discusses acute and chronic fluoride poisoning.

Another possible source of chronic poisoning may be the use of fluorine containing insecticides used in spraying fruits and vegetables. This has necessitated a federal legal tolerance on such spray residues of $^{7}/_{100}$ grain of fluorine per pound of food, which is equivalent to about 2.9 parts per million.

McCollum and his co-workers[141] and Schulz and Lamb[142] first showed the detrimental effects of the inclusion of fluoride in the diet of experimental animals. Their observations[141] on the bleaching and fragility of the bones and teeth and of the overgrowth of the maxillary incisors following excessive erosion of the opposing mandibular incisors[143] have been confirmed by numerous investigators who have added to our knowledge. The use of natural phosphates or superphosphates with high fluoride content as mineral supplements to farm animals has frequently resulted in chronic fluoride poisoning. Stunting of growth, emaciation, lameness due to bone abnormality and fragility, and tooth changes similar to those of human dental fluorosis have been described.[144]

Additional evidence for the action of fluorine as a modifier of calcium and phosphorus metabolism is the observation[145] that fluoride decreases the severity of rickets in rats, prolongs the life of rachitic rats[146] and causes an unorganized calcification when vitamin D is given.[145] When administered together with vitamin D to rachitic rats, it inhibits the healing process. Fluoride given to the normal mother causes delay and some disorganization of calcification of the bones of suckling rats.[147] Greenwood[140] cites recent reports that pathologic bone changes occur in people living in endemic mottled areas for long periods of time. However, in a recent radiologic study[148] of persons in two Illinois communities, where the water supplies contained 1.5 to 3 parts per million of fluoride and where dental fluorosis was widespread, no demonstrable skeletal sclerosis occurred even though the water was taken for long periods. Smith[149] was unable to find any bony changes in children with mottled teeth and suggested that teeth are much more sensitive to fluoride than the bony skeleton.

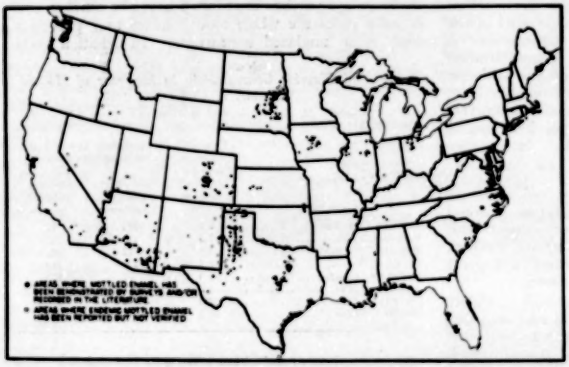
AREAS WHERE MOTTLED ENAMEL HAS BEEN DEMONSTRATED BY SURVEYS AND/OR RECOGNIZED IN THE LITERATURE
AREAS WHERE ENDEMIC MOTTLED ENAMEL HAS BEEN REPORTED BUT NOT VERIFIED

Fig. 1.—Distribution of mottled enamel in the United States. In August 1938 there were about three hundred and seventy-five known areas divided among twenty-six states where this condition occurred in varying degrees of severity (Dean and McKay[138]).

Fluoride is known as an enzyme poison, specifically inhibiting the formation of phosphopyruvate from phosphoglycerate. The reports in the literature on its effect on phosphatases in vivo are conflicting.[150] In vitro experiments indicate an inhibition of phosphatases[151] and esterases.[152]

136. Dean, H. T.: Chronic Endemic Dental Fluorosis (Mottled Enamel), J. A. M. A. **107**: 1269-1272 (Oct. 17) 1936. Dean, H. T., and McKay, F. S.: Production of Mottled Enamel Halted by Change in the Common Water Supply, Am. J. Pub. Health **29**: 590-596 (June) 1939.

137. Nichols, M. S.: Occurrence, Pathological Aspects and Treatment of Fluoride Waters, Am. J. Pub. Health **29**: 991-998 (Sept.) 1939.

138. Dean, H. T.: Fluorine, Mottled Enamel and Dental Caries, J. Pediat. **16**: 782-794 (June) 1940; Chronic Endemic Dental Fluorosis (Mottled Enamel).[138] Hawkins, J. W., and Gordon, J. E.: Epidemiological Aspects of Mottled Enamel, Am. J. M. Sc. **199**: 431-446 (March) 1940. Nichols.[137] Dean and McKay.[138]

139. Roholm, K.: Fluorine Intoxication, London, H. K. Lewis Ltd., 1937.

140. Greenwood, D. A.: Fluoride Intoxication, Physiol. Rev. **20**: 582-616 (Oct.) 1940.

141. McCollum, E. V.; Simmonds, Nina; Becker, J. Ernestine, and Bunting, R. W.: The Effect of Additions of Fluorine to the Diet of the Rat on the Quality of the Teeth, J. Biol. Chem. **93**: 553-562 (April) 1925.

142. Schulz, J. A., and Lamb, A. R.: The Effect of Fluorine as Sodium Fluoride on the Growth and Reproduction of Albino Rats, Science **61**: 93-94 (Jan. 23) 1925.

143. McCollum, Simmonds, Becker and Bunting.[141] Schulz and Lamb.[142]

144. Peirce, A. W.: Chronic Fluorine Intoxication in Domestic Animals, Nutrition Abstr. & Rev. **9**: 253-261 (Oct.) 1939. Bosworth, T. J.; Green, H. H., and Murray, M. M.: Discussion on Fluorosis in Man and Animals, Proc. Roy. Soc. Med. **34**: 391-396 (May) 1941.

145. Morgareidge, K., and Finn, S. R.: Effect of Fluorine on the Activity of Vitamin D in Rachitic Rats, J. Nutrition **20**: 75-84 (July) 1940.

146. Finn, R. R., and Kramer, M.: Effect of Fluorine on Life Span of Rachitic Rats, Proc. Soc. Exper. Biol. & Med. **48**: 843-845 (Dec.) 1940.

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151. Ochoa, S.: "Coupling" of Phosphorylation with Oxidation of Pyruvic Acid in Brain, J. Biol. Chem. **138**: 751-773 (April) 1941. Massart, L., and Dufait, R.: Fluorisbemmung und Metallaktivierung der Hefephosphatase, Naturwissensch. **27**: 806-807 (Dec. 1) 1939.

152. Lorvenbart, A. S., and Peirce, G.: The Inhibiting Effect of Sodium Fluoride on the Action of Lipase, J. Biol. Chem. **9**: 397-413, 1908.

The synergistic action of thyroid and fluoride has been noted. Fluoride when given in conjunction with thyroid accentuates the effect on the basal metabolic rate produced by the thyroid, whereas the fluorine alone has no effect.[153] Fluoride enhances the toxicity of thyroid in chicks and vice versa.[154] Thyroid and thyrotropic hormone likewise enhance the bleaching of rat incisors by fluoride.[155]

The fluoride content of cow's milk is only slightly affected by increasing the fluoride intake—the milk level remaining appreciably below toxic levels.[156] However, it is possible that women exposed to fluorides may be able to transmit enough fluoride in their milk to affect the developing teeth of the infant.[157] From the somewhat meager evidence [158] it would appear that food is relatively unimportant compared to water as a source of this element. The question has been presented [158a] of the possible danger of chronic fluorine poisoning arising from the use of dicalcium phosphate as a dietary supplement during pregnancy and for infants and children.

Fluorine has become of even greater nutritional interest and importance since the discovery of Armstrong [159] and Armstrong and Brekhus [160] that the enamel of sound teeth contained more fluorine than that of carious teeth, their average values being 0.0111 and 0.0069 per cent respectively. This is the only element whose concentration has been found to differ between normal and carious teeth, and the suggestion was made that the increased fluorine content might play a role in the resistance to caries.

Numerous papers have since appeared of a chemical, clinical and experimental nature with supporting evidence for a relationship between fluorine and the incidence of dental caries. It is interesting to note that before the finding of Armstrong and Brekhus there were many observations in the literature [161] pointing out a decreased severity of caries in areas of endemic dental fluorosis.

Dean and his co-workers [162] have published a valuable series of papers concerned with human epidemiologic studies. They indicate an inverse relationship between the fluoride concentration of the water supply and the incidence of dental caries in children. It is significant that in communities with a water supply containing fluorides in concentration but slightly above the minimal threshold of endemic dental fluorosis (1.0 part per million) and where the incidence of mottled enamel was low, the dental caries experience was much less than in communities using fluoride free water.[162] Earlier work [162] had shown the inverse relationship between endemic dental fluorosis and dental caries, but

Fig. 2.—Mottled enamel (endemic dental fluorosis) of mild degree. This illustration and figure 3 are from Dean, H. T., and McKay, F. S.: Am. J. Public Health **29**: 590 (June) 1939, and figures 3 and 4 from Dean, H. T.; McKay, F. S., and Elvove, Elias: Pub. Health Rep. **53**: 1736 (Sept. 30) 1938, through the courtesy of Dr. Dean of the U. S. Public Health Service.

Fig. 3.—Mottled enamel of moderate degree. Note the whiteness, pigmentation, pitting and lack of luster particularly noticeable in this illustration and in figure 4.

the later results indicate that the limited immunity to dental caries is not dependent on the presence of macroscopic mottled enamel. The results at Bauxite, Ark.,[164] indicate that exposure to high fluoride water for only the first several years of life resulted in increased resistance to caries for at least several years after a change to a low fluoride water supply. In all

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154. Phillips, P. H.; English, H. E., and Hart, E. B.: The Augmentation of the Toxicity of Fluorosis in the Chick by Feeding Desiccated Thyroid, J. Nutrition **10**: 399-407 (Oct.) 1935.

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157. Brinch, O., and Rohdin, K.: Paradentium **6**: 147, 1934, cited by Bosworth, Green and Murray.[50]

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162. Dean, H. T.: Endemic Fluorosis and Its Relation to Dental Caries, Pub. Health Rep. **53**: 1443-1452 (Aug. 19) 1938. Dean, H. T.; Jay, P.; Arnold, F. A., Jr.; McClure, F., and Elvove, E.: Domestic Water and Dental Caries, Including Certain Epidemiological Aspects of Oral L. Acidophilus, ibid. **54**: 862-888 (May 26) 1939. Dean, Jay, Arnold and Elvove, footnotes 163 and 164.

163. Dean, H. T.; Jay, P.; Arnold, F. A., Jr., and Elvove, E.: Domestic Water and Dental Caries: II. A Study of 2,832 White Children, Aged 12 to 14 Years, of Eight Suburban Chicago Communities, Including Lactobacillus Acidophilus Studies of 1,761 Children, Pub. Health Rep. **54**: 761-792 (April 11) 1941.

164. Dean, H. T.; Jay, P.; Arnold, F. A., Jr., and Elvove, E.: A Dental Caries Study, Including L. Acidophilus Estimations of a Population Severely Affected by Mottled Enamel and Which for the Past Twelve Years Has Used a Fluoride Free Water, Pub. Health Rep. **56**: 365-381 (Feb. 28) 1941.

the studies the salivary Bacillus acidophilus counts reflected the dental caries rate. Evidence that the problem needs further study is given in the recent report[164a] of a study of school children exposed for two years to a domestic water which was increased in fluoride content from 0.1 to 0.7 parts per million. The dental caries experience rate and the L. acidophilus counts were similar to those in communities with fluoride-free water.

Recent investigations with rats show that fluorides can greatly inhibit induced dental caries when administered either during tooth development[165] or after formation of the teeth.[166] The mechanism by which

Fig. 4.—Mottled enamel of severe degree. The pigmentation occurs after tooth eruption and increases with age.

Fig. 5.—Normal enamel.

fluoride acts is not completely established, but it appears to be by one or both of the following: (*a*) by the fluoride entering the tooth structure and giving it caries resistant properties or (*b*) by inhibiting bacterial action on food particles and on the tooth. There is evidence for both views.

Fluorides in minute amounts limit acid production by mouth bacteria, as do fluorosed and fluorine treated enamel and dentin; in larger amounts growth is inhibited.[167] In vitro and in vivo acquisition of fluorine by teeth has been studied,[168] it has been found that enamel and dentin can acquire fluoride and that treated samples show reduced solubility,[169] although apparently the amounts of fluoride present in slightly fluorosed teeth are too small to alter their acid solubility. Arnold and McClure[170] have found that subcutaneous injection of fluoride as contrasted to oral administration produced no significant reduction in induced dental caries of rats, although the fluoride content of the teeth increased, they believe that these results show that if fluoride acts by affecting structure it must be introduced during the period of tooth development.

Fluorine's concomitant effect of mottling enamel even in minute amounts unfortunately means that for the present, at least, its use as an inhibitor of human dental caries is most decidedly in the experimental stage. It remains to be seen whether topical application of fluoride or its intake by persons whose permanent teeth have already formed are effective and safe means of inhibiting dental caries. One recent preliminary report on topical application to a small number of cases over a period of only one year is optimistic.[170a]

There is no evidence from the investigations with fluorine-low diets[171] that this element is essential. However, more refined nutritional experiments or the elucidation of its role in tooth and bone structure may show that it is necessary.

SELENIUM

Selenium poisoning has gained prominence as a problem in livestock nutrition and as a possible health hazard to man since 1933, when selenium was found[172] in samples of wheat which had previously been shown to be toxic to livestock and to laboratory animals.[173] The ingestion of selenium bearing vegetation has thus been thought to be concerned with the pathologic conditions of farm animals known as "alkali disease" and "blind staggers."[174] Plants growing in seleniferous areas often contain high concentrations of the element in some organic form and presumably in the protein

164a. Arnold, F. A.; Dean, H. T., and Elvove, E.: Domestic Water and Dental Caries. IV. Effect of Increasing the Fluoride Content of a Common Water Supply on the Lactobacillus Acidophilus Counts of the Saliva, Pub. Health Rep. **57**: 773-780 (May 22) 1942.

165. Cox, G. J.; Matuschak, Margaret C.; Dixon, Sara F.; Dodds, Mary L., and Walker, W. E.: Fluorine and Its Relation to Dental Caries, J. Dent. Res. **18**: 481-490 (Dec.) 1939.

166. Miller, B. F.: Inhibition of Experimental Dental Caries in the Rat by Fluoride and Iodoacetic Acid, Proc. Soc. Exper. Biol. & Med. **39**: 389-393 (Nov.) 1938. Hodge, H. C., and Finn, S. B.: Reduction in Experimental Rat Caries by Fluorine, ibid. **42**: 318-320 (Oct.) 1939. Sognnaes, R. F.: Effect of Local and Systemic Fluorine Administration on Experimental Rat Caries, J. Dent. Res. **19**: 287 (June) 1940. Proc. Cheyne, V. D.: Inhibition of Experimental Dental Caries by Fluorine in the Absence of Saliva, Proc. Soc. Exper. Biol. & Med. **43**: 58-61 (Jan.) 1940; Study of the Mechanism of Inhibition of Dental Caries by Fluorine, J. Dent. Res. **19**: 280-281 (June) 1940. Proc. McClure, F. J., and Arnold, F. A., Jr.: Observations on Induced Dental Caries in Rats: Reduction by Fluorides and Iodoacetic Acid, ibid. **20**: 97-105 (April) 1941. Finn, S. B., and Hodge, H. C.: Reduction in Experimental Caries by Fluorine, J. Nutrition **22**: 253-266 (Sept.) 1941. McClure, F. J.: Effect of Fluoride on Rat Caries and on Composition of Rat's Teeth, ibid. **22**: 391-398 (Oct.) 1941.

167. Bibby, B. G., and Van Kesteren, M.: The Effect of Fluorine on Mouth Bacteria, J. Dent. Res. **19**: 391-402 (Aug.) 1940. Harrison, R. W.: Bacterial Flora in Experimental Dental Caries of the Rat, Proc. Soc. Exper. Biol. & Med. **39**: 459-461 (Dec.) 1938.

168. Volker, J. F.; Hodge, H. C.; Wilson, H. J., and Van Voorhis, S. N.: The Adsorption of Fluorides by Enamel, Dentin, Bone and Hydroxyapatite as Shown by the Radioactive Isotope, J. Biol. Chem. **134**: 543-548 (July) 1940. Perry, Mabel W., and Armstrong, W. D.: On the Manner of Acquisition of Fluorine by Mature Teeth, J. Nutrition **21**: 35-44 (Jan.) 1941. McClure,[89] Norvold, R. W.; Inglis, J. H., and Armstrong, W. D.: External Acquisition of Fluorine by Enamel, J. Dent. Res. **20**: 232-233 (June) 1941, Proc. Volker,[89] McClure, F. J.: Fluorine Acquired by Mature Dog's Teeth, Science **95**: 256 (March 6) 1942.

169. Volker, J. F.: Effect of Fluorine on Solubility of Enamel and Dentin, Proc. Soc. Exper. Biol. & Med. **43**: 725-727 (Dec.) 1939; Solubility of Fluorosed Enamel and Dentin, ibid. **42**: 643-645 (April) 1940.

170. Arnold, F. A., Jr., and McClure, F. J.: Observations on Induced Dental Caries in Rats: II. The Effect of Subcutaneous Injection of Fluoride, J. Dent. Res. **20**: 457-463 (Oct) 1941.

170a. Cheyne, V. D.: J. Am. Dent. A. **29**: 804-807 (May) 1942.

171. Sharpless, G. R., and McCollum, E. V.: Is Fluorine an Indispensable Element in the Diet? J. Nutrition **6**: 163-178 (March) 1933. Evans, R. J., and Phillips, P. H.: A New Low Fluorine Diet and Its Effect on the Rat, ibid. **18**: 353-360 (Oct.) 1939.

172. Robinson, W. O.: Determination of Selenium in Wheat and Soils, J. A. Off. Agr. Chem. **16**: 423-424, 1933.

173. Franke, K. W.: A New Toxicant Occurring Naturally in Certain Samples of Plant Foodstuffs. I. Results Obtained in Preliminary Feeding Trials, J. Nutrition **8**: 597-608 (Nov.) 1934. Moxon,[175]

174. Moxon, A. L.: Alkali Disease or Selenium Poisoning, Bull. 311, South Dakota Agr. Exper. Sta., May 1937, pp. 1-91. Moxon includes in this detailed review an account of Franke's work beginning in 1929.

fraction.[175] The affected localities are limited in size but widely scattered throughout the Great Plains of the western United States.[176]

Selenium poisoning results in stunting of growth, emaciation, loss of hair, decreased reproductive power, atrophy and cirrhosis of the liver, gastric damage and anemia.[177] Cattle, hogs and horses develop erosion of the bones, abnormalities of the hooves, and atrophy of the heart in the chronic form of the poisoning ("alkali disease").[177] The eggs of poisoned poultry have a low hatchability because of the abnormal development of the embryos into monstrosities.[178] Experiments with various species have demonstrated[179] that daily ingestion of selenium in amounts as low as 0.2 mg. per kilogram of weight causes minor symptoms and that doses in excess of 1 mg. per kilogram daily are dangerously toxic. The natural plant toxicant is less toxic than the inorganic salts but the symptoms are the same. It is noteworthy that within certain limits the toxicity of plant and inorganic selenium is determined by the protein-selenium ratio in the diet rather than by the selenium intake.[180] Selenium compounds inhibit cellular respiration probably by poisoning enzymes, such as succinodehydrogenase, which are dependent on sulfhydryl groups for activity.[181]

Persons living in rural areas where selenium is endemic absorb selenium in sufficient amounts to excrete it in concentrations[182] much greater than those found in nonseleniferous areas.[183] Analysis for selenium revealed its widespread occurrence in animal as well as plant foodstuffs from seleniferous localities. There is no definite clinical evidence of human selenium intoxication in these areas, but there is suggestive evidence that man is not immune.[182] The seriousness of selenium poisoning in these populations is undoubtedly reduced by the fact that much of the flour and vegetables consumed come from nonseleniferous regions.[184]

BORON

Although boron is known to be essential for plants, there is as yet no experimental evidence that it is necessary for animals. It appears to exist normally in small amounts in animals,[185] in milk[186] and in eggs.[187] Numerous investigators have observed the rapid urinary excretion of the element.[188] Two recent studies[189] have shown that rats can thrive on diets extremely low in boron (less than 0.8 microgram per rat daily).

ALUMINUM

The use of aluminum in cooking utensils and in baking powders has centered more attention on its possible toxicity than on its role in normal metabolism. The evidence indicates that ingested aluminum is absorbed in but small amounts[190] and that the amounts occurring in the usual human dietary (about 12 to 13 mg. daily[191]) are not harmful.[192] This element is widely distributed in nature and has been found to occur in very small amounts in plant and animal tissues and in milk.[193] It is not definitely known at present whether or not aluminum is a dietary essential. Rats maintained for six weeks on a diet containing as little as 1 microgram of aluminum daily appeared normal;[190] nevertheless, when the aluminum intake was increased there was definite absorption and storage. On the basis of balance studies with young children, Scoular[194] suggests that this element is not essential.

CONCLUSION

Six trace elements, namely iron, copper, iodine, manganese, cobalt and zinc, have been demonstrated to be essential to animal life. Our knowledge of the human requirement for manganese, cobalt and zinc is so meager that the possibility of deficiency of any one of them occurring cannot be dismissed, although, because of their broad distribution in nature and probably small requirement, the likelihood of any acute or widespread deficiency appears remote. The essential trace elements and the other trace elements which occur in living matter but whose importance is unknown stand as a challenge to nutritionists and physiologists. The indispensable "traces," just as the vitamins, appear to be keys to fundamental physiologic processes the mechanisms of which are either only partially understood or in most cases completely unknown.

175. Franke, K. W., and Painter, E. P.: Selenium in Proteins from Toxic Foodstuffs: I. Remarks on the Occurrence and Nature of the Selenium Found in a Number of Foodstuffs of Their Derived Products. Cereal Chem. **13**: 67-70 (Jan.) 1936. Jones, D. B.; Horn, M. J., and Gersdorff, C. E. F.: The Selenium and Cystine Contents of Some Partial Hydrolysis Products of Gluten from Toxic Wheat, ibid. **14**: 130-134 (Jan.) 1937.

176. Trealease, S. F.: Bad Earth, Scient. Month. **54**: 13-28 (Jan.) 1942.

177. Moxon.[174] Smith, Lillie, Stohlman and Westfall.[175]

178. Franke, K. W., and Tully, W. C.: A New Toxicant Occurring Naturally in Certain Samples of Plant Foodstuffs: V. Low Hatchability Due to Deformities in Chicks, Poultry Sc. **14**: 273-279, 1935. Franke, K. W.; Moxon, A. L.; Poley, W. E., and Tully, W. C.: Monstrosities Produced by the Injection of Selenium Salts into Hen's Eggs, Anat. Rec. **63**: 15-22 (April) 1936.

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181. Wright, C. I.: The Effect of Sodium Selenite and Selenate on the Oxygen Consumption of Mammalian Tissues, Pub. Health Rep. **53**: 1825-1836 (Oct. 14) 1938; Effect of Selenium on Urease and Arginase, J. Pharmacol. & Exper. Therap. **68**: 220-230 (Feb.) 1940.

182. Smith, M. I.; Franke, K. W., and Westfall, B. B.: Selenium Problem in Relation to Public Health: Preliminary Survey to Determine Possibility of Selenium Intoxication in the Rural Population Living on Seleniferous Soil, Pub. Health Rep. **51**: 1496-1505 (Oct. 30) 1936. Smith, M. I., and Westfall, B. B.: Further Field Studies on the Selenium Problem in Relation to Public Health, ibid. **52**: 1375-1384 (Oct. 1) 1937.

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184. Several reviews of the selenium problem have appeared recently: (Moxon.[174] Trealease.[176] Smith, M. I.: Chronic Endemic Selenium Poisoning, J. A. M. A. **116**: 562-567 [Feb. 15] 1941); in addition, the danger of selenium as an industrial hazard has been noted (Dudley, H. C.: Selenium as a Potential Industrial Hazard, Pub. Health Rep. **53**: 281-292 [Feb. 25] 1938).

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187. Drea, W. F.: Spectrum Analysis of Hen Eggs and Chick Tissues, J. Nutrition **10**: 351-355 (Oct.) 1935. Hove, Elvehjem and Hart.[186]

188. Kent, N. L., and McCance, R. A.: The Absorption and Excretion of "Minor" Elements in Man: Silver, Gold, Lithium, Boron and Vanadium, Biochem. J. **35**: 837-844 (July) 1941. Hove, Elvehjem and Hart.[186]

189. Orent-Keiles, E.: The Role of Boron in the Diet of the Rat, Proc. Soc. Exper. Biol. & Med. **44**: 199-202 (May) 1940. Hove, Elvehjem and Hart.[186]

190. Among the numerous papers establishing this fact may be mentioned:
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Myers, V. C., and Mull, J. W.: The Influence of the Administration of Aluminum on the Aluminum Content of the Tissues and on the Growth and Reproduction of Rats, ibid. **78**: 605-613, 1928.
Mackenzie, K.: Excretion and Absorption of Aluminum in the Pig, Biochem. J. **24**: 1433-1441, 1930; Excretion and Absorption of Aluminum in the Rat, ibid. **25**: 287-291, 1931.
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Scoular.[194]

191. Burn, J. H.: Aluminium and Foods, Res. Rep. Ext. Ser. 162 Brit. Non-Ferrous Metals Res. Assn., April 1932, p. 1-29. Beal, G. D.; Unangst, R. B.; Wigman, H. B., and Cox, G. J.: Aluminum Content of Foodstuffs Cooked in Aluminum and in Glass, Industr. & Engin. Chem. **24**: 405-407 (April) 1932.

192. Monier-Williams, G. W.: Aluminum in Food, Reports on Public Health and Medical Subjects 78, London, Ministry of Health, 1935. Burn.[191]

193. Hove, E.; Elvehjem, C. A., and Hart, E. B.: Aluminum in the Nutrition of the Rat, Am. J. Physiol. **123**: 640-643 (Sept.) 1938.

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Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. HOWARD A. CARTER, Secretary.

THE THERAPEUTIC VALUE OF ULTRAVIOLET RADIATION

The Council on Physical Therapy recognizes the place of ultraviolet radiation therapy in medical practice. However, it is also cognizant of the fact that this type of therapy is often exploited beyond its limitations. The following statements set forth the views of the Council with respect to the conditions in which ultraviolet radiation therapy is of benefit:

Either natural or artificial heliotherapy is used. The artificial sources of therapeutic ultraviolet radiation are the carbon arc lamp, the low voltage (hot) mercury vapor lamp and the high voltage (cold) mercury glow lamp. For further information on the artificial sources of ultraviolet radiation the reader is referred to the chapter "Sources of Ultraviolet and Infra-Red Radiation Used in Therapy—Physical Characteristics," by W. W. Coblentz, Ph.D., D.Sc., in the Handbook of Physical Therapy, a publication of the American Medical Association.

VITAMIN D[1]

Ultraviolet irradiation with wavelengths shorter than 3,130 (particularly 2,967) angstroms exerts an influence on calcium and phosphorus even when the diet is adequate.[2] But of even greater importance from the standpoint of protection against dietary deficiencies is the action of ultraviolet radiation in rectifying partial lack of the components necessary for proper calcification of bone and teeth.[3]

From the provitamins in the skin, ultraviolet irradiation gives rise to vitamin D, the agent which promotes normal calcium anabolism and retention of phosphorus. Therefore it may prevent and cure rickets, adult as well as infantile, promote growth and prevent excessive loss of lime from the body. It is necessary not only for the development of teeth but for their protection later in life.

Ultraviolet irradiation may be used in the treatment of infantile tetany, a symptom complex occurring in rickets when the blood calcium is low. The treatment of choice is a combination of a calcium salt (lactate or gluconate), a diet low in phosphate and optimal vitamin D.[4] Latent tetany may become manifest when rachitic infants are irradiated if sufficient calcium is not available, owing to the suddenly increased mobilization and deposition of calcium in the growing bones.

While irradiation of parathyroidectomized animals and man will keep them free from tetany, administration of vitamin D itself is far more efficient.

When an animal is irradiated, its skin, liver, fat and muscle become antirachitically active.[5] Ultraviolet radiation forms vitamin D either in the cells of the living organism or in its foodstuffs. Direct exposure of the skin to ultraviolet rays from the sun or from artificial sources results in the formation of vitamin D within the organism, but the Council cannot recognize statements or implications that ultraviolet radiation from an artificial source has all the beneficial effects of exposure to sunshine.

The Council on Foods and Nutrition has made the decision that for the present milk is the only common food which will be considered for acceptance when fortified with vitamin D. One of the methods used to impart antirachitic properties to accepted vitamin D milks is irradiation with ultraviolet shorter than 3,130 angstroms. Activation depends on the same wavelengths effective directly in the cure and prevention of rickets.

Vitamin D in some way regulates the passage of calcium and phosphorus across the intestinal wall. It exerts its action by raising the blood calcium and/or phosphate. This is associated usually with an increased net absorption from the intestine, though under certain circumstances the bones may provide the calcium and phosphate. The net retention of the animal as a whole is the resultant of two opposing factors: (1) increased absorption from the intestine or diminished excretion to it and (2) increased excretion by the kidney. As the dosage of vitamin D becomes larger, the second factor overtakes the first.

TUBERCULOSIS[6]

Both natural and artificial ultraviolet radiation are of definite value in the treatment of some forms of tuberculosis. There is still considerable difference of opinion on which regions of the light spectrum are most efficacious as well as confusion as to the tuberculous conditions that respond best to this treatment.

Natural heliotherapists, especially those working in high altitudes, emphasize solar radiation and aerotherapy. On the other hand, those in cloudy climates have stressed the use of artificial lights and still others, on occasion, the x-rays.

The physiologic effects of radiant heat energy suggest that clinical results of therapy with sunlight are at least in part dependent on the red and infra-red region. Most recently the response of certain forms of superficial tuberculosis, especially of the skin, to heat radiation speaks very clearly for this.

The exact part played in the clinical usage of radiation by the total visible spectrum is difficult to say, although in all probability it is in some way physiologically effective.

In tuberculosis, on the basis of the quality of ultraviolet wavelengths and of the results obtained at the seashore, at inland sea level and in the mountains, Danish workers are convinced that ultraviolet energy of the region longer than 313 millimicrons is the one effective in the treatment. The additional part played by the action of moving air on the skin in the solar treatment of extrapulmonary tuberculosis must not be discredited. Probably the combination of all factors contributes to the end result.

The radiations of artificial sources represent approximations to sunlight, and no two sources are alike in respect to the distribution of the energy they emit. Therefore, different sources do not produce the same physiologic or therapeutic action. The energy emitted by various artificial sources varies in intensity and in spectral distribution. The intensity of the radiation of sunlight on the earth's surface varies considerably, particularly on account of location, season and time of day. It will vary as much as 5 per cent in total intensity and a variation of five to ten times in noon hour ultraviolet winter to summer.

For therapeutic purposes the sun, the mercury vapor arc in quartz and the flaming carbon arc burning cored carbons filled with mixtures of carbon dust and metals have been found to be most practical. The mercury vapor lamp has been particularly developed for its emission of ultraviolet, although it also emits well in the visible part of the spectrum. Its ultraviolet component represents between 9 and 28 per cent of the total energy of all wavelengths emitted by the lamp. A carbon arc consuming 25 amperes or more and burning specific carbons, such as "sunshine" carbons, closely approximates highland sunshine. Carbon arcs of varying amperage and with special cored carbons will emit, almost according to the needs, widely varying intensities in many regions of the spectrum.

An important question in the selection of these various sources of light is the minimum ultraviolet radiant power that a source must emit in order to insure effective therapeutic action. The amount of ultraviolet that can be applied to the body without producing a burn depends on the tolerance of the skin. The erythemal reaction is really the only physiologic one that is established with a relatively high degree of accuracy. As a

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2. Laurens, Henry: Physiological Effects of Radiant Energy, New York, Chemical Catalog Company, Inc., 1933, pp. 257, 261.
3. Laurens: Physiological Effects of Radiant Energy, p. 285; Photochemistry in Medicine: A General Outline, in Cold Spring Harbor Symposia on Quantitative Biology, Cold Spring Harbor, L. I., N. Y., the Biological Laboratory, 1933, vol. 1, p. 277; Sunlight and Health, Scient. Monthly 42:312 (April) 1936. Bunker, J. W. M., and Harris, R. S.: New England J. Med. 210:165 (Jan. 28) 1937.
4. Laurens: Physiological Effects of Radiant Energy, p. 334; Photochemistry in Medicine;[3] Sunlight and Health.[2]
5. Laurens: Physiological Effects of Radiant Energy, pp. 347, 389; Photochemistry in Medicine;[3] Sunlight and Health.[2]
6. Mayer, Edgar: Light Therapy and Roentgen Therapy in Tuberculosis, J. A. M. A. 105:1599 (Nov. 16) 1935.

criterion it is a simple and practical means of preventing severe burns and as a reaction it is a good means of judging the effectiveness of a lamp.

The conditions, clinical and otherwise, indicating the selection of one source of light in preference to others depend in part also on the convenience of usage, the availability of the source of light and the cost of running. In the past, carbon arc lamps of high amperage have been more generally applied for exposures of groups. The mercury quartz lights are now applicable for exposures of groups as well as individual patients. The carbon arcs of lower amperage, as well as mercury arcs, can be used for single patients. Irradiation with artificial light, as ordinarily employed indoors, lacks some apparently important accompaniments of outdoor solar exposures, such as constantly moving fresh air.

Pulmonary Tuberculosis.—For uncomplicated pulmonary tuberculosis, no clinical evidence is at hand to prove the indication for ultraviolet radiation. The lack of accurately controlled observations among certain workers makes it necessary to accept their favorable reports most cautiously. Until contrary evidence is at hand, ultraviolet irradiation is contraindicated in the treatment of uncomplicated exudative pulmonary tuberculosis. Sunlight or artificial light, if employed at all, should be used cautiously in the treatment of proliferative or fibrotic pulmonary tuberculosis, which may be accompanied by elevation of temperature. Intense sunlight should be avoided, and diffuse daylight or early morning and late afternoon sunlight should be watched for. The indications here resemble those of tuberculin therapy.

In pulmonary tuberculosis, even when quiescent, harm has been done by sunlight exposures, especially with too intense and prolonged irradiations. Solar heat alone, especially in summer, can prove very exhausting. An observing patient will note fatigue, exhaustion, irritability or even overstimulation after these solar baths. With this reaction, sunlight should be discontinued. If symptoms are due to overdosage only, exposures may be resumed after an interval, shorter or less intense exposures being employed. Increase of local symptoms, such as cough and expectoration, and pleurisy, or of systemic symptoms, such as elevated pulse and temperature, serves as a guide. In these cases it may be advisable to substitute irradiations of diffuse daylight of longer duration, or of low intensity sunlight in the early morning and late afternoon hours.

In an active febrile pulmonary tuberculosis complicated by active intestinal tuberculosis, mercury quartz irradiations have been regularly used by many for the intestinal complication and not infrequently with favorable effect. In such cases the activity and nature of the pathologic changes of the pulmonary disease have been disregarded. The favorable empirical results thus obtained and the poor results obtained when other treatments have been used justify this as an indicated therapy.

For other forms of active extrapulmonary tuberculosis, such as that of bones and joints, or lymph nodes complicating active pulmonary tuberculosis, light exposures have been often used to advantage, so that the pulmonary disease, if not rapidly progressive, offers no contraindications. However, careful observations, especially in exudative forms of pulmonary disease, will not rarely reveal the development of harmful pulmonary focal reactions due to excessive exposures to ultraviolet. This should deter one from exposing such patients indiscriminately.

Focal reactions have been shown to occur in the lungs, even when direct sunlight is reflected in overdosage on a tuberculous larynx. Some workers observed their occurrence when the limbs alone were irradiated with the mercury quartz and carbon arc lights. In the use of both lamps and sunlight, one often notices on beginning treatment a slight elevation of temperature with mildly increased focal pulmonary symptoms. This reaction has been likened by some observers to a tuberculin reaction. A focal reaction such as has been observed in the lungs, larynx and joints has been obtained in cases in which good pigmentation developed. A latent period always exists before signs of the reaction appear. By the screening of lupus areas from the light and exposing the rest of the body, the diseased tissue has often healed, indicating apparently the transport by the blood of some substance to the focus. However, therapy is preferably carried out by exposing the diseased parts in addition, because the local inflammatory reactions obtained through direct irradiations may be of importance.

Harm due to irradiation of patients with pulmonary tuberculosis results almost always from an indiscriminate use of ultraviolet radiation, with overdosage. It may be manifested with increased local symptoms; namely, increased cough and expectoration, localized pain, blood streaked sputum or hemoptysis and, following these, fever and tachycardia.

Pleural Tuberculosis.—Pleural tuberculosis, dry or serous, especially if it is the initial clinical manifestation, is occasionally aided by ultraviolet therapy. The acute serous form is not to be irradiated. A tuberculous pleurisy with no obvious pulmonary disease usually responds to ordinary rest and hygienic-dietetic treatment; cases not responding after about a month of such treatment may call for irradiations. Pleurisies occurring in the course of obvious pulmonary tuberculosis, as well as pneumothorax cases, offer the same indications as the lung disease. Tuberculous empyemas do not respond. If sinuses are infected, they are rarely helped by local and general ultraviolet applications. Pleural tuberculosis in the Negro, peculiarly enough, has been cited as favorably responsive to ultraviolet radiation.

Laryngeal Tuberculosis.—Laryngeal tuberculosis is practically always secondary to pulmonary tuberculosis, so that the indications for the treatment of the larynx depend on the nature of the disease in the lungs. Here again ultraviolet by itself is not curative but exercises its part only as an adjuvant to the other mainstays of treatment. General ultraviolet light exposures are made to the body, with at times additional laryngeal local exposures. The acute forms of laryngeal tuberculosis, particularly those with edema, are not indications for ultraviolet therapy. Exposures of ultraviolet radiation are made with the aim of producing a mild focal reaction, the reaction being allowed to subside before the next exposure is made. Those patients in whom mild focal reactions developed through irradiation showed often a greater tendency to heal, but no advantage to be gotten from a local treatment to the larynx is cause enough to compel a patient to leave his bed when his active disease indicates bed rest. Furthermore, general body irradiation in this complication plays a large part. Local ultraviolet therapy has proved useful as a postoperative measure in cauterization cases, and as a sedative measure in cases in which cauterization cannot be done.

Tuberculous lymph nodes may be seen clinically in three different stages; namely, as enlarged nodes which have undergone hyperplasia, as nodes which have proceeded to the stage of caseation and softening, or as softened nodes which have perforated to the exterior through a sinus tract. In the first stage, general body exposures to repeated erythema doses of ultraviolet radiation are not infrequently followed by an inflammatory reaction at the nodes with slight pain, tenderness and swelling. In the majority of cases the inflammation subsides and the lymph node finally heals. Occasionally, nodes in the hyperplastic stage may become caseous under light treatment and at times may have to be treated surgically by excision. In such instances ultraviolet radiation is of great value when used postoperatively in preventing the formation of tuberculous sinuses. In the second stage of caseation, light exposures alone will frequently bring about resolution. When softened lymph nodes reach the stage of fluctuation, aspiration or incision is necessary, and then light is most effective. In the third stage, excellent results are obtained in clearing up sinuses of long standing, but occasionally roentgen exposures may have to be combined with light treatment for complete healing to take place. Local irradiation of the sinus area should be made in addition to general irradiation of the body. In cured cases, exposures have averaged from three to eight months.

General body exposures are usually combined with those to the nodes or sinuses. In addition, repeated aspiration, when possible, is made of any fluctuating node, generally entering with the needle from above. At times incision into a softened node is necessary. If the nodes do not heal with these measures, x-rays are resorted to.

The prognosis will vary frequently, depending on whether the patient has also pulmonary tuberculosis and what the prognosis of the pulmonary disease alone will be.

For nodes not yet broken down, local and general sunlight or artificial light exposure, together with the application of x-rays, is the treatment of choice. In the softening stage of tuberculous adenitis, treatment is first best attempted with sunlight or sunlamps and without x-rays. Aspiration is usually necessary. With sinuses, occasionally the use of radiant heat may help to close them if combined with ultraviolet exposure.

Secondary Ulcerative Intestinal Tuberculosis.— Secondary ulcerative intestinal tuberculosis is the most frequent complication of pulmonary tuberculosis, occurring in from 50 to 80 per cent of the patients who die of pulmonary tuberculosis as revealed by necropsies.

Artificial light and solar therapy, as well as a rich vitamin diet, should be used in most cases, as they frequently relieve the symptoms and bring about recovery. When the desired results are not obtained by radiation therapy, roentgen treatment of the intestinal tract should be carefully given or other additional measures employed.

Excellent results are obtained with the use of artificial sources of radiation, with general exposures either of the mercury arc in quartz or of carbon arc sources. The results depend on factors such as the general status of the patient and the location, extent and nature of the disease in the intestine. Those with far advanced pulmonary and intestinal tuberculosis with little remaining resistance cannot be expected to respond, but intestinal tuberculosis today is healed in many patients, and necropsies have often confirmed this.

It is seen that, with ultraviolet exposures and hygienic treatment, the symptoms referable to the intestinal tract generally vanish during the first few months of irradiation, but the exposures should be continued for at least six months to two years. The loss of symptoms is frequently surprising, abdominal pain and discomfort disappearing, diarrhea and fever subsiding quickly and general improvement taking place. Roentgenologic studies show that the intestinal irritability as visualized by x-ray defect clears up entirely in many instances. It is usually best to continue ultraviolet therapy for many months after an apparent cure has occurred.

Peritoneal Tuberculosis.—In peritoneal tuberculosis, ultraviolet therapy always deserves a trial first. The serous exudative type generally responds to irradiation, both in children and in adults. The dry proliferative form, usually adhesive, is more refractory. When there have been ulcerations and large caseous lymph nodes, as commonly seen in children, the results are most unsatisfactory. When the disease is of long standing, healing is more difficult than when irradiation is begun a short time after onset.

Pain under ultraviolet therapy usually disappears rapidly, especially in children. Large quantities of ascitic fluid may disappear in a few months.

Genitourinary Tuberculosis.—If unilateral renal tuberculosis is diagnosed at the very onset of symptoms and when such symptoms are slight, conservative treatment with ultraviolet radiation has on rare occasions prevented the need of surgical intervention. As a rule, nephrectomy is indicated. For unilateral progressive renal tuberculosis or bilateral disease in which the more involved kidney is removed, ultraviolet radiation is to be advised as a desirable postoperative treatment. It may have a favorable action on the genital organs and the remaining kidney and effectively contribute to the healing of a tuberculous cystitis, whether alone or in association with medical treatment. Ultraviolet therapy exercises a healing action on the stump of the ureter, which so often shows residual ulceration, resulting in a discharging sinus or a persistent cystitis. It has given excellent results, even with chronic gaping wounds, extensive and deep, and even when covered with ulcerations and tuberculous granulations. The edges of the wound are separated and held apart with broad strips of adhesive plaster to allow the ultraviolet rays to penetrate the depths and to prevent formation of a closed pocket, which would favor purulent retention as a result of a premature superficial closure. Such extensive wounds may heal with a linear elastic scar and often are hardly visible in the pigmented skin.

Ultraviolet is particularly indicated in those not infrequent cases of renal tuberculosis complicated by genital tuberculosis in which the seminal vesicles and prostate are involved, thus often obliging postponement of cystoscopy to avoid trauma of the prostate and the risks of general infection. In such cases it is imprudent to consider the kidney disorder as an independent lesion, for it is but one manifestation of tuberculosis affecting the whole genitourinary system. Therefore, before surgical intervention it is advisable to treat the concomitant lesions with a methodical course of ultraviolet radiation to make cystoscopy and nephrectomy procedures of less risk of dissemination.

In bilateral renal tuberculosis, ultraviolet therapy is indicated. It may help render the disease quiescent; its occasional analgesic action on ulcerations of the bladder is particularly welcome. It is in these cases of bilateral tuberculosis that advanced infection implicating the genital tract is so often encountered. While the renal lesions tend to become stationary, there is often a steady regression and improvement of the prostatic and bladder lesions and their clinical symptoms.

Advanced bilateral renal and bladder tuberculosis has rarely responded to any form of therapy, especially when the patient is cachectic. Pain has occasionally been relieved by ultraviolet exposures, but the frequent urination is very resistant. Occasionally removal of the more diseased kidney has temporarily relieved the symptoms. Postoperative sinuses, especially following nephrectomy, have responded in a large number of cases to ultraviolet therapy of all forms.

Circumscribed tuberculous lesions of the urinary bladder have improved under local intravesical exposures of ultraviolet radiations from the low pressure cold mercury discharge.

Bone and Joint Tuberculosis.—In bone and joint tuberculosis, heliotherapy, although not the mainstay of treatment, is always employed in combination with other forms of therapy. Orthopedic measures, rest in the open and light form the basis of conservative therapy. Combined conservative treatment includes orthopedic measures, such as immobilization of joints, traction and careful use of passive and active motion, use of ultraviolet air, tuberculin and diet and judicious application of surgery.

Ultraviolet therapy must be admitted to be a real addition to our resources. It is not to be expected that it will produce new cartilage in place of that which has been utterly destroyed; it does not make the process of fusion less necessary than it has been heretofore, but it can help this develop. It is wrong to expect that its use will bring about regeneration of bone equal to that of a few vertebral bodies when they have been destroyed; but when this has occurred and a gibbous deformity exists, ultraviolet therapy has aided orthopedic treatment in fusing these diseased surfaces, especially when employed together with postural treatment.

Surgical fusions are less commonly performed on children under 12 years of age. If performed on adults or children, the disease must first show some evidence of retrogression; thus surgery is to help nature. Following operation, patients are still treated for from one to two years, and during this period heliotherapy plays an important part.

Both mercury arc in quartz and carbon arc irradiations, employed as general and local exposures for prolonged periods of time, have proved aids in the treatment of bone and joint tuberculosis. The technic of irradiation is the same as that described with other forms of tuberculosis. With early exposures, the joints or bones often respond with increase of the local swelling and pain and, if a sinus is present, increased secretion. These in turn subside. Small joints yield more quickly to treatment than large ones. The knee joint is refractory, and particularly obstinate are old fistulas of the spinal column, pelvis or hip. In many instances treatment should be continued for two or more years.

Other Forms of Tuberculosis.—Ultraviolet ray therapy is indicated in various other forms of tuberculosis. Many manifestations of cutaneous tuberculosis respond well to ultraviolet irradiation. Tuberculous ulcers of the mouth and pharynx, usually secondary to advanced pulmonary or laryngeal tuber-

culosis or to hematogenous dissemination, are most resistant. Electrocoagulation is a more effective therapy.

Aural and ocular tuberculosis are difficult to affect with ultraviolet, although corneal ulcers and phlyctenular conjunctivitis have not infrequently healed under local exposures. Roentgen therapy has proved effective with tuberculosis of the cornea and iris, but its dose must be moderate and repeated regularly at intervals of about four weeks. These measures are indicated when tuberculin therapy has failed.

RELATIVE MERITS OF DIFFERENT FORMS OF RADIATION

The following outline is constructed with the realization that as yet the relative merits are not accurately defined and not accepted by all. It is offered merely as a possible working basis.

Sunlight is available in almost every locality at some season of the year. Its intensity is variable, but moving air and low intensity sunlight or diffuse daylight can generally be used. In some places where the extreme cold of winter prevents outdoor exposures for a few months, artificial sources of light should be resorted to.

1. *Uncomplicated Pulmonary Tuberculosis.*—(*a*) Sunlight is to be used only after prolonged trial of routine rest, hygienic-dietetic treatment and perhaps in cases in which surgical treatment has failed to cause satisfactory healing (exudative tuberculosis always excluded). Carefully graduated general body exposures are to be made to sunlight of low intensity or to diffuse daylight, together with air baths in the earlier morning or later afternoon hours. The so-called pretuberculosis of children, as well as chronic pleurisies, are all forms in which sunlight can be the treatment of choice.

(*b*) Artificial lights (mercury arc in quartz and carbon arc) deserve a trial only after routine therapy has failed, but one should not expect promising results except in isolated instances. They may occasionally help as an adjuvant. Progressive cases with fever and exudative tuberculosis are excluded. Pleurisies and the "pretuberculosis" of children can be favorably influenced.

2. *Active Extrapulmonary Tuberculosis Without Active Pulmonary Tuberculosis.*—Tuberculosis of the skin, lymph nodes, bones, joints, genitourinary tract, peritoneum, intestine: By this is meant that the signs and symptoms of active or progressive disease are due, not to the pulmonary tuberculosis, but to the extrapulmonary focus. Signs of active disease include both local and constitutional signs.

(*a*) Sunlight is the treatment of choice for bones and joints, lymph nodes and genitourinary tract, especially in the highlands. Graduated exposures of the body are to be made to sunlight, together with the use of rest and hygiene and whatever surgical and orthopedic measures may be necessary. Results are excellent if sunlight is employed over prolonged periods, even in active but not rapidly progressive forms of the disease. Artificial lights should be used, in addition, on cloudy days, especially in cases of cutaneous tuberculosis or discharging sinuses.

(*b*) Artificial lights (mercury arc in quartz and carbon arc) are to be used usually as substitutes for sunlight. However, they may be preferable to sunlight for certain complications, such as superficial, peritoneal and intestinal tuberculosis. Superficial forms include lupus vulgaris and scrofuloderma, keratitis and phlyctenular conjunctivitis. General exposures are always made with additional local exposures over the area of disease.

3. *Active Extrapulmonary Tuberculosis with Active Pulmonary Tuberculosis Accompanied by Fever.*—Both pulmonary and extrapulmonary tuberculosis show subjective evidence of active or progressive disease.

(*a*) Sunlight is the treatment of choice in tuberculosis of the bones and joints and in genitourinary tuberculosis, sunlight of low intensity in the early morning and late afternoon hours being used. The solar and air exposures should be given very gradually.

(*b*) Artificial lights (mercury arc in quartz and carbon arc): The mercury quartz light is often preferred when pulmonary disease is exudative and febrile, because of its great deficiency in heat rays. Better results are then had in tuberculosis of the intestine, peritoneum, epididymis and lymph nodes. It is advisable to alternate mercury quartz irradiations with exposure to the outside air and diffuse daylight.

(*c*) With an acute progressive tuberculous laryngitis, ultraviolet irradiations applied locally are inadvisable until the acuteness has subsided; but, if other measures have failed, ultraviolet irradiations may be tried as a final treatment, if only for their possible analgesic effect. Combinations of local irradiations of ultraviolet and general body exposures are always employed, if possible, according to the indications mentioned.

Benefits are undoubtedly obtained by patients suffering from tuberculosis of the bones, articulations, peritoneum, intestine, lymph nodes and larynx when the entire body is exposed to carefully graded doses of natural sunlight or to radiation emitted by certain artificial sources of light rays. The beneficial results of such irradiation are due not only to ultraviolet rays. The visible and infra-red rays, as well as the conditions of the atmosphere, play a certain part in the therapeutic effect.

In tuberculosis of the skin, lupus vulgaris alone can be said to respond satisfactorily to ultraviolet irradiation. Scrofuloderma and erythema induratum react favorably at times to general and local exposure, although not as constantly.

In tuberculosis of the bones and articulations, it is generally agreed that suitable graded exposure to natural sunlight is most effective in aiding the healing accomplished by orthopedic and other measures. Exposure to artificial sources of radiation is valuable here as a second choice.

Pulmonary tuberculosis, per se, is not an indication for ultraviolet therapy; stationary pleural tuberculosis has often been helped by this measure.

Genitourinary tuberculosis deserves a trial of such treatment in combination with other measures. Local exposure to ultraviolet rays of circumscribed tuberculous lesions of the urinary bladder has been shown to yield favorable results, but the method requires special applicating devices and, above all, skilful treatment of the bladder lesion.

Ocular tuberculosis and aural tuberculosis respond infrequently to light. Oral tuberculosis is most resistant.

Fistulas are often resistant to such treatment. Postoperative sinuses, in contrast, are most responsive.

Intestinal, peritoneal and lymph node tuberculosis especially indicate ultraviolet therapy and often are rapidly responsive.

In tuberculosis, overdosage has produced harmful focal reactions. Here light may set up a focal reaction similar to that of tuberculin.

The erythemic reaction is an accurate indicator of skin tolerance.

Hence a preliminary exposure of a small area to gage the minimal perceptible erythema will avoid undue burns.

SURGICAL VERSUS CONSERVATIVE TREATMENT OF BONE AND JOINT TUBERCULOSIS

With any form of tuberculosis, ultraviolet is to be used merely as an adjuvant and should be combined with all other indicated forms of therapy. The mainstays of treatment, such as rest, proper dietary, and hygienic outdoor life, still remain.

With bone and joint tuberculosis, orthopedic measures combined with light still play the major role. Indications for surgical intervention may depend on many factors: economic and social conditions, the age of the patient, the joints involved, their number and the stage and extent of the disease, involvement of other organs such as the lungs and kidneys, and complicating abscesses or sinuses. Joint tuberculosis is still a local manifestation of a constitutional disease. Surgical measures are therefore in turn to be recognized as adjuvant procedures to be followed by prolonged conservative therapy. Intervention by surgical fusion is always to be seriously considered in the presence of advanced joint destruction. Restoration of function may occur in the synovial form of joint tuberculosis, even in the presence of large effusions; but complete functional return of motion in a joint is doubtful when the bony parts have been destroyed to a considerable degree.

(To be continued)

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SATURDAY, OCTOBER 24, 1942

SUPREME COURT TO REVIEW QUESTIONS RELATED TO PRACTICE OF MEDICINE

An indictment was filed on Dec. 20, 1938 in Washington, D. C., which charged the American Medical Association, the Medical Society of the District of Columbia, two other medical societies, certain officers of the medical societies and others with conspiring to restrain the trade of Group Health Association, a corporation, in violation of section 3 of the Sherman Act. The District Court first held that the indictment did not charge the defendants with any offense known to the law, but the Court of Appeals of the District of Columbia reversed this holding and directed a trial of the case. In due course a trial was held and the jury found the American Medical Association and the Medical Society of the District of Columbia guilty and all of the other defendants not guilty.

On May 29, 1941 the District Court entered judgment on the verdict of the jury. An appeal was taken to the Court of Appeals of the District of Columbia, and that court on June 15, 1942 affirmed the judgment of the lower court. The American Medical Association and the Medical Society of the District of Columbia filed a petition in the Supreme Court of the United States asking that court to issue its writs of certiorari to review the decision of the Court of Appeals and to reverse it and to hold that there had been no violation of section 3 of the Sherman Act. By their petition for certiorari filed in the Supreme Court of the United States, the American Medical Association and the Medical Society of the District of Columbia contended that there were eight important questions presented by the record in the case wherein the trial court and the Court of Appeals committed error.

On Oct. 12, 1942 the Supreme Court of the United States granted the petition for writs of certiorari and thereby agreed to review and consider the record in the case but limited the review to the consideration of the first three questions presented by the petition for writs of certiorari, which were:

1. Whether the practice of medicine and the rendering of medical services as described in the indictment are "trade" under section 3 of the Sherman Act.

2. Whether the indictment charged or the evidence proved "restraints of trade" under section 3 of the Sherman Act.

3. Whether a dispute concerning terms and conditions of employment under the Clayton and Norris-LaGuardia acts was involved, and, if so, whether petitioners were interested therein, and therefore immune from prosecution under the Sherman Act.

The American Medical Association and the Medical Society of the District of Columbia will now file their printed brief and argument in the Supreme Court of the United States and thereafter the case will be argued orally and the court will then consider the three questions which it has consented to review and in due course file its decision and opinion.

DIETARY HEPATIC CIRRHOSIS

The cirrhosis of the liver observed in chronic alcoholism is probably the most important of various forms. New experimental evidence developed by György and Goldblatt [1] of Western Reserve University suggests the possibility that nutritional factors are involved in the development of this form of damage to the liver. Experimental work with animals indicates that the essential cause of alcoholic cirrhosis in man may be a low protein intake associated with a deficiency of the vitamin B complex. Three years ago the Cleveland investigators [2] observed that young experimental rats maintained on a diet deficient in the vitamin B complex developed acute focal or diffuse necrosis with fat infiltration of the liver, with an occasional diffuse periportal fibrosis. Indication of an infectious or toxic origin of this hepatic injury was not present, nor was the condition prevented by the daily addition to the diet of adequate amounts of thiamine, riboflavin and pyridoxine. Further experiments showed that animals could be protected from injury to the liver when small amounts of thiamine, riboflavin and choline were added to the diet deficient in the vitamin B complex. The addition of pyridoxine was without effect. Pantothenic acid also failed to produce any effect unless given early, when it was beneficial.

Further study of the observed results suggested to the Cleveland investigators the possibility that the low food intake characteristic of animals fed on diets lacking in the vitamin B complex was an essential cause of the observed hepatic degeneration followed by cirrhosis. Experiments accordingly were planned to test the hypothesis that the protein content of the diet was important in the development of the liver injury.

1. György, Paul, and Goldblatt, Harry: J. Exper. Med. 75:355 (April) 1942.
2. György, Paul, and Goldblatt, Harry: J. Exper. Med. 70:185 (Aug.) 1939.

Groups of animals were maintained on seven different rations, in which the essential difference was the relative amount of protein (casein) in each. The amount of casein was varied from 18 per cent in the standard diet down to as low as 5 per cent. Each ration contained 20 per cent fat, from 50 to 70 per cent of cane sugar or corn starch, 2 per cent cod liver oil and 4 per cent salt mixture. The diets were appropriately supplemented with thiamine, riboflavin, pyridoxine and calcium pantothenate.

As a test, 184 rats were put on a diet in which the routine casein ration had been reduced one half; i. e., to 10 per cent. To this modified diet a routine daily supplement of vitamin B complex factors was added in the different subgroups. Without this supplement, 75 per cent of the rats developed hepatic injury during the first one hundred and fifty days, 65 per cent of them showing cirrhosis. Addition of 20 mg. of choline to the daily diet reduced these percentages by about one third, while a daily supplement of 100 mg. of *l*-cystine increased the percentage and severity by about one third. The apparent toxic effects of cystine were neutralized by a daily administration of choline or by a daily supplement with yeast. The beneficial effects of yeast were apparent even when the low dose (0.5 Gm.) was given but three times weekly. The most severe necrosis and cirrhosis of the liver, often accompanied by ascites and pleural and pericardial effusion, were noted in groups in which the daily intake of casein had been reduced to 8 per cent.

The accumulated data from these and numerous other tests led to the tentative conclusion that under the conditions of their nutritional experiments the dietary hepatic injury was due to two factors, an insufficient protein intake supplemented by an insufficient amount of some unidentified vitamin B complex factor.

The closest analogy to these experimental conditions in human pathology would be in alcoholic addicts. Low protein intake combined with an insufficient amount of vitamin B is a prominent feature of the daily diet of most persons addicted to alcohol. The assumption of a specific toxic action of alcohol becomes superfluous in this analogy, as it is superfluous in the etiology of pellagra or beriberi of alcoholic addicts. The recent claim [3] of the beneficial effect of a "highly nutritious diet" supplemented by vitamin B concentrate on alcoholic cirrhosis in man is an apparent confirmation of their suggested theory.

Experiments thus far reported by the Cleveland investigators were exclusively of a prophylactic nature. In a few animals hepatic injury confirmed by biopsy was treated by the daily administration of yeast or liver powder; thus far (two months) success has been limited. Therapeutic studies are being continued.

3. Patek, A. J., Jr., and Post, Joseph: J. Clin. Investigation **20**: 481 (Sept.) 1941.

FUMIGATION AND HUMIDITY

The decreased effectiveness of germicidal vapors with increased humidity reported by Wells and Zappasodi [1] of the Henry Phipps Institute, University of Pennsylvania, is contrary to generally accepted views of the effects of fumigation. Seventy years ago Lister introduced his carbolic spray into the operating theater. His spray technic was gradually abandoned by surgeons as they became convinced that most surgical infections are due to bacteria introduced on the hands or instruments. Recently, however, the necessity for augmenting routine aseptic technic with precautions against air borne bacteria has again become of practical clinical interest. Among other methods of sterilization of air is the employment of germicidal mists or aerosols.

Twort and his co-workers [2] of Portslade Laboratories, Sussex, England, examined various phenolic mists by means of a duplex ultramicroscope which enabled them to estimate the size, speed and rate of evaporation of mist particles. The English investigators assumed that these germicidal particles act solely by collision with air borne infectious agents. They develop elaborate mathematical equations to express this rate of collision and the resulting rate and efficiency of the germicidal action. In actual tests in closed atmospheres they found that sufficiently fine mists of 10 per cent hexylresorcinol in propylene glycol gave germicidal effects in apparent confirmation of their mathematical equation. Fully evaporated mists (vapors) of this mixture were noneffective on air borne Escherichia coli and other routine test organisms.

Working with propylene glycol mists and air borne influenza virus, however, Robertson and his colleagues [3] of the University of Chicago drew the opposite conclusion. Their studies indicated that the germicidal action is due principally to the liberation of gas by the rapid evaporating aerosol droplets and not to collisions between mist droplets and infectious particles. They found that an atmosphere containing a 1:2,000,000 dilution of fully evaporated propylene glycol would protect mice from infection with the air borne influenza virus. All 35 control mice which breathed the same contaminated air but without the addition of the germicidal gas died in from six to ten days, with typical influenzal consolidation of the lungs.

In studying the effects of the same propylene glycol vapor on air borne beta streptococci, Wells and Zappasodi at first obtained irregular and confusing results. Afterward they noted that these contradictory results were associated with humidity changes in their exposure chamber. With carefully controlled humidity experi-

1. Wells, W. F., and Zappasodi, Peter: Science **94**: 277 (Sept. 18) 1942.
2. Twort, C. C.; Baker, A. H.; Finn, S. R., and Powell, E. O.: J. Hyg. **40**: 253 (May) 1940.
3. Robertson, O. H.; Loosli, C. G.; Puck, T. T.; Bigg, Edward, and Miller, B. F.: Science **94**: 612 (Dec. 26) 1941.

ments they found that high humidity almost completely neutralizes the germicidal action of propylene glycol vapor. Dehumidification had the opposite effect, increasing the germicidal action threefold. In the average of twenty-four experiments with air of medium humidity, for example, the bactericidal titer of the vapor was 1.59 lethes (an arbitrary unit "equivalent to bacterial removal by one displacement of the atmosphere within the chamber"). In control tests with highly humidified atmospheres the average germicidal titer was reduced to 0.69 lethe. In artificially dehumidified atmospheres the average titer was increased to 4.29 lethes.

Current Comment

ULTRAVIOLET ROOM STERILIZATION

A quantitative study of the efficiency of ultraviolet radiation to reduce the number of viable air borne spores in a closed room has been reported by Kligman [1] of the University of Pennsylvania. The room in question was used as a laboratory for the manufacture of "grain spawn," a heat sterilized rye grain medium inoculated with the mycelium of the cultivated mushroom Agaricus campestris. In commercial practice sets of one hundred and eighty milk bottles are sterilized and inoculated daily. Before attempting room sterilization there was an average spoilage of twenty bottles per set, or an 11 per cent economic loss. This average was cut to eleven bottles per set, or about 6 per cent, after an air filtration apparatus had been installed. In order to reduce the spoilage further, supplementary measures were tried, including formaldehyde fumigation. The method finally adopted was the use of two 30 inch ultraviolet generators mounted on the ceiling equidistant from the ends of the room. As a test of the antiseptic efficiency of these generators the rate of atmospheric sterilization was first determined quantitatively. Ten sterile Petri dishes containing potato-dextrose agar were placed on small tables in various parts of the room. Each dish was opened for three minutes and then incubated. In control tests before turning on the generators, 151 colonies developed on the ten exposed plates. The room was retested by the same technic after one, two, three, four and five hours' ultraviolet irradiation. By the end of one hour the number of viable air contaminants had been reduced to 116 on ten plates, a 23 per cent reduction in the initial count. There was a further reduction to 97 colonies by the end of two hours' and to 13 colonies after three hours' irradiation. Only 1 colony developed on the ten plates after four hours' irradiation, a 99.33 per cent reduction in the original number of viable air contaminants. The room has been used for several weeks for the routine preparation of grain spawn, each day's use being preceded by four hours' ultraviolet sterilization. To date the average spoilage in the ultraviolet sterilized room has been about one bottle per set, a 95 per cent reduction in the previous economic loss. Kligman believes that this method of room sterilization has numerous other applications in industrial plants and in clinical laboratories.

1. Kligman, A. M.: Science 96:69 (July 17) 1942.

OCCUPATIONAL DISEASES AND THE INDUSTRIAL ACCIDENT COMMISSION OF MARYLAND

In spite of innumerable surveys and investigations, little reliable information is available about many important professional relationships in the administration of workmen's compensation. The published reports available are insufficient to permit a thoroughgoing evaluation of official medical boards which act as advisers to administrators on controversial medical issues. The situation is clarified through the appearance of an annual report by the Medical Board for Occupational Diseases of the Maryland Industrial Accident Commission,[1] purported to be the first document of its kind in this country. This report is unlike the conventional statements issued by compensation boards, since it does not confine itself to statistical analyses but presents also an abstract of all claims heard, the medical issues involved, the observations of the Medical Board and the final opinion by the Workmen's Compensation Commission itself. There have not been reversals of decisions of the Medical Board. The procedure outlined in this report, or such modification as would fit special circumstances, will seem to physicians most enlightened and sensible. This is particularly true if the weight of medical opinion cannot be arbitrarily set aside and if the character of appointment and tenure of office are nonpolitical. In any event these abstracted case reports and the opinions of the Medical Board will provide students of compensation and the medical profession at large with factual data which can be widely regarded as dependable medical opinion on the ability of occupation to cause or contribute to abnormal or disease states.

1. First Annual Report of the Medical Board for Occupational Diseases, Maryland Industrial Accident Commission, for the Period June 1, 1939 to Oct. 31, 1940 Inclusive.

FIFTY YEARS A MEDICAL LIBRARIAN

Mr. James F. Ballard, director of the Boston Medical Library, completed fifty years of service to that institution on October 23. Formerly he was president of the Medical Library Association, and his classification of books is used in almost every medical library in this country. His advice has been sought in the past by the Rockefeller Foundation and by the General Education Board in establishing medical libraries in this country and abroad. One of his chief interests has been fifteenth century books. The trustees have proposed to the fellows and friends of the Boston Medical Library the immediate accumulation of a fund to be known as the James F. Ballard Publication Fund in recognition of his half century of continuous efficient and unselfish service. The first issue, now in press, about which an announcement will soon be made, will be "A Catalogue of Mediaeval and Renaissance Manuscripts and Incunabula in the Boston Medical Library," compiled by Mr. Ballard under the direction of the librarian, Dr. Viets.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession.

NEW NAVY HOSPITAL IN PANAMA

A new hospital at a navy station in the Panama Canal zone was recently dedicated and is now under command of Capt. C. W. Ross, with Capt. M. L. Marquette as the executive. At the dedication, speeches were made by Capt. D. E. Cummings, chief of staff of the Fifteenth Naval District, and by Comdr. Edward D. Garffin, officer in charge of constructing the hospital. A second navy hospital in this area is now under construction. With the completion of this new hospital, navy men will be treated by their own officers instead of depending to some extent on army hospital facilities in the Panama Canal.

MEDICAL OFFICERS AWARDED THE PURPLE HEART

The American Army Forces in China, Burma and India announce the award of the Purple Heart to Col. Robert P. Williams, M. C., Major Gordon S. Seagrave, M. C., Major Donald M. O'Hara, D. C., and Capt. John H. Grindlay, M. C. The citation of Colonel Williams was "For singularly meritorious and essential service in Burma between 15 March 1942 and 1 May 1942. By thorough, painstaking and untiring effort Colonel Williams assisted the Chinese Fifth Army in the organization and maintenance of its medical service, without which the usefulness of that army would have been greatly reduced. This outstanding service reflects great credit on the military forces of the United States."

Major Seagrave, Major O'Hara and Captain Grindlay were thus cited: "For singularly meritorious service in Burma between 15 March 1942 and 1 May 1942. By the maintenance of a surgical service close to the front, under frequent bombing, working for long hours with meager and improvised equipment, [he] rendered a service to the Chinese Fifth Army which resulted in the saving of many Chinese lives. This outstanding service reflects great credit on the military forces of the United States."

APPOINTMENTS BY OFFICE OF CIVILIAN DEFENSE

Dr. Ward L. Mould of the Office of Civilian Defense, Washington, D. C., has been appointed medical adviser to industrial plants to assist in planning for adequate medical services in the event of a major emergency and will cooperate with the Emergency Medical Service organized in communities. ——Dr. W. Roderick Brown of Pittsburgh has been appointed to the staff of the Office of Civilian Defense in Washington, D. C., to supervise the training of Negro physicians in Emergency Medical Service for Civilian Defense. Dr. Brown will carry out his program for the present through the postgraduate institutes for physicians sponsored by the National Tuberculosis Association. These institutes will be held in Arkansas, California, Florida, Indiana, Kentucky, Louisiana, Mississippi, Maryland, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia and the District of Columbia. Dr. Brown is a graduate of Howard University College of Medicine, Washington, D. C., and for several years has been a member of the staff of the chest unit of the University of Pittsburgh Medical Center and visiting physician to the Pittsburgh City Tuberculosis Hospital. ——Dr. Karl J. Thomson, associate director of the Metropolitan Life Insurance Company Sanatorium, Mount McGregor, N. Y., has joined the Washington staff of the Office of Civilian Defense. He is a graduate of Harvard Medical School and has carried on research at Harvard and at Albany Medical College.

RED CROSS BLOOD DONOR SERVICE

The American Red Cross Blood Donor Service was recently selected to receive the Army-Navy Production Award for its work in procuring blood for dried plasma for the armed forces. The eighteen blood donor centers located throughout the country will therefore have the right to fly the Army-Navy Production Award Pennant, and all employees will be privileged to wear special Army-Navy E pins. In February 1941 the Surgeon Generals of the Army and Navy requested the American Red Cross to set up a center to procure blood for 15,000 units of dried plasma for emergency transfusions. Three months later the amount requested was increased to 215,000 units and following the attack on Pearl Harbor the request was made for 165,000 additional units of dried plasma, making a total of 380,000 units for delivery by July 1, and this amount was exceeded three weeks ahead of schedule. The American Red Cross will continue to expand its blood collecting facilities as rapidly as laboratory arrangements can be made to process the blood into dried plasma and into serum albumin, a more recently developed blood substitute.

CORRECTION—PUBLIC HEALTH NURSES NEEDED

The U. S. Civil Service Commission recently issued a call to public health nurses. The commission desires now to correct the statement made regarding the omission of high school education as a requirement for public health nurse positions. This statement was made in error by the commission. The educational requirements for public health nurse cannot be obtained without completion of a high school education.

The requirements are completion, subsequent to Jan. 1, 1920, of a full course in a recognized school of nursing including two years in a general hospital having a daily average of 50 bed patients or more, registration as a graduate nurse and completion of one year of study in public health nursing at a college giving a course of study approved by the National Organization for Public Health Nursing. One year of public health nursing experience also is necessary. The public health nurse positions pay $2,000 a year.

Other nursing opportunities open in the federal service are junior public health nurse, $1,800 a year; graduate nurse, $1,800 a year; junior graduate nurse, $1,620; graduate nurse for the Panama Canal service, $168.75 a month; nursing education consultant, $2,600 to $4,600 a year, and public health nursing consultant, $2,600 to $5,600 a year.

Except for Panama Canal service there are no age limits for any of these positions. Applications will be accepted at the commission's office in Washington, D. C., until the needs of the service have been met.

SPECIAL TRAINING COURSE AT FIELD SERVICE SCHOOL

Fifty-four officers of the medical department of the army completed training at the Medical Field Service School, Carlisle Barracks, Pa., October 3, for assignments in medical battalions of new infantry divisions now being activated. These officers came from twenty different states and twenty-three of them were captains, nineteen first lieutenants, ten majors and two second lieutenants. All of them held commissions in the medical corps except five, who were commissioned in the medical administrative corps. A new class took up this course of instruction on October 3.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 2412 has been ordered favorably reported by the House Committee on the Judiciary, a bill to provide benefits, including medical care, for the injury, disability or death of civilians or their detention by the enemy and for the prevention and relief of civilian distress arising out of the present war.

H. R. 7368 has been reported to the House, with amendments, a bill to discharge more effectively the obligations of the United States under certain treaties relating to the manufacture and distribution of narcotic drugs, by providing for domestic control of the production and distribution of the opium poppy and its products.

Bills Introduced.—S. 2834, introduced by Senator Clark, Missouri, a bill to define the term misconduct as used in veterans' regulations providing for compensation and pension so as to limit the meaning of the term to felonious misconduct. S. 2846, introduced by Senator Reynolds, North Carolina, and H. R. 7703, introduced by Representative Shafer, Michigan, propose to amend the Railroad Retirement Act of 1937 so as to provide disability annuities after completion of a specified term of service.

OFFICIAL NOTES

ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES, SEPT. 17 AND 18, 1942

A two day session of the Board of Trustees was held at the headquarters of the Association, September 17 and 18, preceded by a full day meeting of the Executive Committee. Some of the matters acted on are reported here; others will be discussed at later meetings.

APPOINTMENTS

The following appointments were made: Dr. L. H. Bauer, Hempstead, N. Y., to represent the American Medical Association at the Conference on Rehabilitation, called by the American Physiotherapy Association.

Dr. Charles W. Roberts of Atlanta, Ga., to the Advisory Committee of the Woman's Auxiliary to succeed Dr. Arthur W. Booth.

Dr. W. W. Bauer, Director of the Bureau of Health Education, Dr. John S. Coulter of Chicago, Dr. Peter J. Steincrohn of Hartford, Conn., and Dr. H. A. Christian of Brookline, Mass., on a committee established by the American Association for Health, Physical Education and Recreation for the purpose of endeavoring to frame a simple definition and statement for the use of health educators on the value, dangers and limitations of exercise.

Dr. Charles W. Roberts to succeed Dr. Roger I. Lee on the Committee on Scientific Exhibits. Dr. Elmer L. Henderson, Chairman of the Committee.

Dr. Glenville Giddings of Atlanta, Ga., on the Agricultural and Industrial Relations Committee of the Southern Regional Research Laboratory.

Mr. George E. Hall of the Bureau of Legal Medicine and Legislation on a special committee of the National Research Council having to do with tests for intoxication.

Dr. George H. Whipple of Rochester, N. Y., was elected as a member and as chairman of the Committee for the Protection of Medical Research to succeed Dr. Elliott C. Cutler, who resigned on going into active service in the Army.

RADIO BROADCASTS

The Board approved cooperation of the Bureau of Health Education with the Blue Network in a weekly daytime series of interviews with prominent physicians. Announcements will be made in THE JOURNAL when these programs begin.

SPANISH AND PORTUGUESE PERIODICALS

The Board approved the publication of monthly periodicals in Spanish and Portuguese.

RESIGNATION OF MAJOR W. P. HOLBROOK FROM THE COMMITTEE ON AMERICAN HEALTH RESORTS

The resignation of Major W. P. Holbrook from the Committee on American Health Resorts, because his duties in the Army make it impossible for him to fulfil his share of the obligations of the committee, was accepted.

FELLOWSHIP FOR STUDY OF PREPARED BREAKFAST CEREAL FOODS

The Board created a special fund of $1,000 for the Council on Foods and Nutrition for the establishment of a fellowship for the study of the composition of a large number of prepared breakfast cereal foods and the grains from which they are made.

STUDY OF HOSPITAL CORPORATIONS ENGAGING IN PRACTICE OF MEDICINE AND OF RELATION BETWEEN PHYSICIANS AND INSURANCE COMPANIES

A committee of three was appointed to study the matter of hospital corporations engaging in the practice of medicine and of the improvement of relations between physicians and insurance companies.

TERMS OF SERVICE OF MEMBERS OF THE COUNCIL ON INDUSTRIAL HEALTH

The Board rescinded action previously taken establishing the tenure of service of members of the Council on Industrial Health as five years and took action establishing these terms as four years. The terms of the present members of the Council will be revised at the annual meeting of the Board in February.

MEETINGS WITH REPRESENTATIVES OF THE HOSPITAL ASSOCIATIONS

The Board authorized arrangements for a meeting with representatives of national hospital associations during its meeting in November for the consideration of medical service and prepayment hospitalization plans.

COOPERATION BETWEEN AMERICAN MEDICAL ASSOCIATION AND AMERICAN PHARMACEUTICAL ASSOCIATION

Authorization was given for the continuation of joint conferences between the American Medical Association and the American Pharmaceutical Association with a view to establishing more cooperative relations between the two organizations.

MEDICAL AND DENTAL CARE OF CIVILIAN COMMUNITIES

The Board, which had previously voted by mail, approved the tentative plan for medical and dental care of civilian communities adopted by the War Participation Committee of the American Medical Association.

COMMITTEE ON STUDENT HEALTH

The Board authorized the establishment of a committee of five to be concerned with the problems and policies relating to student health.

PROVISIONS FOR CIVILIANS FOR MEDICAL CARE AND HOSPITALIZATION NECESSITATED BY ENEMY ACTION

Approval was given for the organization of hospital units in the United States Public Health Service to be called into action in time of enemy action in emergencies only and for no other purpose.

REFURBISHING OF HEADQUARTERS BUILDING

Authorization was given by the Board for the refurbishing of the interior of the headquarters building, which has not been decorated since the addition of the two stories in 1936.

WAR MEDICINE

Authorization was given for publishing *War Medicine* on a monthly basis as soon as expedient.

MEDICAL EXHIBITS FOR MEDICAL SOCIETIES AND SCIENTIFIC ORGANIZATIONS

Exhibits pertaining to the work of the various departments of the American Medical Association and to subjects in which those departments are interested have been prepared for medical societies and other scientific organizations. The exhibits are available on a loan basis. Responsibility for installation and demonstration of the exhibits ordinarily must be borne by the organization to which the material is lent. Only in special instances will the American Medical Association be able to send its own personnel for such duties. Requests for material should be instituted as far in advance as possible, so that the proper reservations can be made. Exact shipping addresses and dates should be given when the request is made. Further information may be obtained from Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

16. Heroes of Medicine: An exhibit, originally shown at the Golden Gate International Exposition in San Francisco, consisting of ten groups of figures—McDowell, Beaumont, Long, Holmes, Sims, Welch, Gorgas, Theobald Smith, Ricketts and Reed. Each group is set in a case with indirect lighting. Models are made of rubber and are quite substantial. Space required, area 10 feet wide by 10 feet deep (or 21 linear feet). Electrical connections, ten outlets using a total of 400 watts. Shipping weight, 933 pounds.

31. Hospital Service in the United States: An exhibit from the Council on Medical Education and Hospitals presenting data on hospitals collected in the annual survey; miscellaneous posters and pamphlets. Space required, one or two booths according to material selected, together with tables for literature. Shipping weight, according to material selected.

34. Tularemia (spread and control): An exhibit from the Scientific Exhibit of the American Medical Association made in conjunction with Dr. Walter M. Simpson, Miami Valley Hospital, Dayton, Ohio, and Dr. Edward Francis, U. S. Public Health Service, Washington, D. C., consisting of transparencies showing clinical cases of tularemia and posters on panels showing the prevalence, animal hosts, insect vectors and what to do to prevent infection. An exposition "microscope" shows the tularemia organism. Space required, an area 10 feet wide by 6 feet deep; no background necessary. Electrical connections, two outlets for lamps in transparency case and exposition "microscope" using 255 watts. Shipping weight, 297 pounds.

35. Tularemia (pathology): An exhibit from the Scientific Exhibit of the American Medical Association of photographs, photomicrographs and roentgenograms collected by Dr. Walter M. Simpson and Dr. Edward Francis, showing the pathologic changes of tularemia in animals and man. Space required, an area 10 feet wide by 6 feet deep; no background necessary. Electrical connections, one outlet for lamps in transparency case using 240 watts. Shipping weight, 260 pounds.

42. "Patent Medicine" Testimonials: An exhibit from the Bureau of Investigation consisting of posters showing testimonials for "patent medicines" with the death notice of the person in the same copy of the newspaper, or the death certificate dated some weeks or months previously. Two visitor participation units, one with a transparent mirror showing appropriate cartoon and one with questions and answers. Space required, a booth with back wall 10 feet wide and side walls 6 feet deep for twelve posters each 24 by 30 inches; two small tables for transparent mirror and question and answer device. Electrical connections, two outlets alternating current, using about 150 watts. Shipping weight, 275 pounds.

44. Cancer Death Certificates: An exhibit from the Bureau of Investigation in conjunction with the Texas State Board of Medical Examiners, presenting some two hundred cancer death certificates from an advertising "cancer" hospital. Space required, an area 10 feet wide by 6 feet deep; no background necessary. Electrical connections, none. Shipping weight, 253 pounds.

46. Food Fads: An exhibit from the Bureau of Investigation consisting of a mechanical attention arrester, two sets of transparencies showing persons whose diet requires special attention and persons whose diet should have been more carefully regulated; six posters each 22 by 38 inches dealing with some of the popular, but foolish, food fads; an exposition file with additional information. Space required, a booth with back wall 10 feet wide and side walls each 6 feet deep; three small tables for transparencies and exposition file. Electrical connections, three outlets for transparency cases and small universal motor totaling about 600 watts. Shipping weight, 389 pounds.

47. Mechanical Nostrums: An exhibit from the Council on Physical Therapy and the Bureau of Investigation showing various mechanical devices, such as the "horse collar" and the "gas pipe" cure, for which weird claims have been made, together with an exposition file containing descriptions of many more similar gadgets. Space required, an area 10 feet wide for a table, with wall space above for 8 panels each 22 by 28 inches. Electrical connections, none. Shipping weight, 330 pounds.

48. Chemistry of Vitamin K and Synthetic Hormones: An exhibit from the A. M. A. Chemical Laboratory consisting of nine charts in frames 24 by 30 inches, showing vitamin K active compounds, the role of vitamin K in blood clotting and rationale of vitamin K therapy, together with photomicrographs. Similar information is given for the synthetic hormones. Space required, background 8 feet wide, with side walls 2 feet deep (or without side walls a background of 12 feet). Electrical connections, none. Shipping weight, 74 pounds.

50. Use and Abuse of Barbiturates: An exhibit from the Council on Pharmacy and Chemistry consisting of posters showing the use and abuse of the barbiturates; a chart giving the names and chemical formulas of thirty products on the market; an exposition file and New and Nonofficial Remedies giving additional information. Space required, a booth with back wall 10 feet wide and side walls 6 feet deep on which to hang charts and posters, a table for exposition file and N. N. R and question box. Shipping weight, 143 pounds.

51. Chemistry of the Gastric Antacids: An exhibit from the A. M. A. Chemical Laboratory consisting of five posters in frames, each 24 by 30 inches, presenting information on the ideal gastric antacid, comparison of gastric antacids, their combining powers, reaction rates and rebound secretions. Space required, a background 10 feet wide. Electrical connections, none. Shipping weight, about 60 pounds.

52. Chemistry of the Sulfonamide Drugs: An exhibit from the A. M. A. Chemical Laboratory consisting of a transparency showing crystals of the sulfonamide drugs, in color, together with six posters, each 24 by 30 inches in size, dealing with the chemistry of the subject. Space required, an area 10 feet wide with a background for posters. Electrical connections, one outlet for transparency case, using 180 watts. Shipping weight, 141 pounds.

53. Nutritionally Improved Flour: An exhibit from the Council on Foods and Nutrition consisting of samples of wheat and flour showing the amount of vitamin B_1 in various milling products; ten posters, each 24 by 30 inches in size, dealing with further aspects of the subject; reprints and pamphlets, together with a question box. Space required, an area 10 feet wide by 6 feet deep, with back wall and side walls for posters (or with no side walls but a back wall 20 feet wide); table for racks and literature, 8 feet long. Shipping weight, 233 pounds.

54. Work of the Council on Physical Therapy: An exhibit from the Council on Physical Therapy consisting of miscellaneous charts in frames, each 24 by 30 inches, together with selected apparatus. The following groups have been found of interest: short wave diathermy; simple apparatus for physical therapy; miscellaneous posters dealing with the work of the Council. Space required, variable according to kind of material selected. Electrical connections, one or more outlets if mechanical material is selected. Shipping weight, variable according to material selected.

55. Posture: An exhibit from the Council on Physical Therapy consisting of a manikin for visitor participation showing correct and incorrect posture; transparencies showing reasons for good posture and panels with posters showing the relation of sitting and posture, the feet and posture, the causes of poor posture and recommendations for good posture. An exposition file gives additional information. Space required, an area 10 feet wide by 6 feet deep; no background necessary; two small tables, one for manikin and one for exposition file. Electrical connections, three outlets for lamps in cases using a total of 440 watts. Shipping weight, 400 pounds.

56. Audiometers and Hearing Aids: An exhibit from the Council on Physical Therapy consisting of apparatus and charts accompanied by demonstrations and lectures on the physics of audiometers and hearing aids; also instruction on the calculation of percentage loss of hearing. Space required, a booth 15 feet wide and 10 feet deep, with a background for charts. Electrical connections, outlet for 1,000 watts. Shipping weight, variable according to amount of material selected.

57. Amputations: An exhibit from the Council on Physical Therapy consisting of six manikins showing most suitable sites for leg amputations, and charts in frames 24 by 30 inches showing sites for finger amputations; question box and two literature racks. Space required, a booth 12 feet wide and 10 feet deep, with a background for charts; one table for racks. Electrical connections, none. Shipping weight, about 800 pounds.

58. Dietary Deficiency Diseases: An exhibit from the Council on Foods and Nutrition of the American Medical Association in conjunction with the Food and Nutrition Board of the National Research Council. There are three transparency cases showing pictures of the results of food deficiencies and eight panels with charts showing the values of various foods, together with a question box and an exposition file giving additional information. Space required, an area 20 feet wide by 6 feet deep; no background necessary; four tables each 4 feet long for transparency cases and files. Electrical connections, three outlets using 1,200 watts. Shipping weight, 640 pounds.

63. Industrial Health: An exhibit from the Council on Industrial Health consisting of a group of posters showing the status of industrial health in the United States. Space required, a booth with back wall 10 feet wide and side walls on which to hang posters. Shipping weight, 125 pounds.

65. Industrial Health Program for a County Medical Society: An exhibit from the Council on Industrial Health consisting of posters on panels, showing the organization and activities of an industrial health program for a county medical society. Space required, an area about 10 feet wide by 6 feet deep; no background necessary. Electrical connections, none. Shipping weight, 200 pounds.

66. Basic Science Laws: An exhibit from the Bureau of Legal Medicine and Legislation consisting of six charts and frames, each 24 by 30 inches, together with a shadow box. Space required, a booth with back wall 10 feet wide, and side walls 6 feet deep (15 linear feet). Electrical connections, one outlet, 120 watts. Shipping weight, 154 pounds.

69. Health Education in the Doctor's Office: An exhibit from the Bureau of Health Education consisting of posters on panels showing educational possibilities of the doctor's waiting room, consultation room, treatment room and the doctor's community contacts. Display racks contain samples of literature dealing with *Hygeia* loan collections, radio talks, pamphlets, posters, bibliographies, and so on. Space required, an area about 10 feet wide by 6 feet deep; one small table for question box; no background necessary. Electrical connections, two outlets for display racks requiring a total of 240 watts. Shipping weight, 500 pounds.

70. Cutaneous Manifestations of Tuberculosis: An exhibit from the Scientific Exhibit of the American Medical Association, in conjunction with the Section on Dermatology and Syphilology, consisting of four panels each 5 feet high and 3 feet wide, showing photographs of cutaneous tuberculosis and conditions which simulate it. Space required, an area 10 feet wide by 3 feet deep; no background necessary. Shipping weight, 166 pounds.

71. Cutaneous Granulomas: An exhibit from the Scientific Exhibit of the American Medical Association, in conjunction with the Section on Dermatology and Syphilology, consisting of photographs of various granulomas (other than tuberculosis and syphilis), including one panel of leprosy and one panel of drugs. The photographs are mounted on six panels, each 5 feet high and 3 feet wide, with legs 2½ feet high, which can be installed readily. Space required, an area 12 feet wide by 3 feet deep; no background necessary. Shipping weight, 250 pounds.

72. Cutaneous Manifestations of Syphilis: An exhibit from the Scientific Exhibit of the American Medical Association, in conjunction with the Section on Dermatology and Syphilology, consisting of about one hundred and fifty photographs of the various syphilitic lesions in different stages of the disease. The photographs are mounted on panels 5 feet high by 3 feet wide, with legs 2½ feet high, which can be installed readily. Space required, an area 18 feet wide by 3 feet deep; no background necessary. Shipping weight, 327 pounds.

74. Experimental Uterine and Extragenital Fibroids Induced by Estrogens: An exhibit originally shown by Dr. Alexander Lipschütz, Department of Experimental Medicine, National Health Service, Santiago, Chile, in the Scientific Exhibit of the American Medical Association. It consists of twenty-nine photographs mounted on boards for easy installation. Space required, a back wall 10 feet wide. Electrical connections, none. Shipping weight, 90 pounds.

78. Aesculapius, Hygeia, Hippocrates and Osler: Four plaster plaques in bas-relief from the Bureau of Exhibits. Each figure is 8½ feet high, 3 feet wide and 6 inches thick. Because of the fragile nature of the plaques, they will be sent only where they can be suitably installed. Shipping weight: Aesculapius 343 pounds, Hygeia 354 pounds, Hippocrates 300 pounds and Osler 366 pounds.

81. Pneumoconiosis: An exhibit prepared for the Council on Industrial Health by the Saranac Laboratory, consisting of transparencies and posters on panels dealing with various phases of pneumoconiosis. Space required, an area 9 feet wide by 15 inches deep; no background necessary. Electrical connections, one outlet for transparency case, using 360 watts. Shipping weight, 205 pounds.

82. Asbestosis: An exhibit prepared for the Council on Industrial Health by the Saranac Laboratory, consisting of transparencies and posters on panels dealing with various phases of asbestosis. Space required, an area 9 feet wide by 15 inches deep; no background necessary. Electrical connections, one outlet for transparency case, using 360 watts. Shipping weight, 204 pounds.

83. Tuberculosilicosis: An exhibit prepared for the Council on Industrial Health by the Saranac Laboratory, consisting of transparencies and posters on panels, dealing with various phases of tuberculosis as it is related to the problem of silicosis. Space required, an area 9 feet wide by 15 inches deep; no background necessary. Electrical connections, one outlet for transparency case, using 360 watts. Shipping weight, 204 pounds.

84. Silicosis: An exhibit prepared for the Council on Industrial Health by the Saranac Laboratory, consisting of two transparency cases and three sets of posters on panels, dealing with various phases of silicosis. Space required, an area 15 feet wide by 15 inches deep; no background necessary. Electrical connections, two outlets for transparency cases, using 720 watts. Shipping weight, 363 pounds.

93. *Hygeia*, the Health Magazine: An exhibit consisting of an enlarged photograph of a small boy, together with two shadow boxes containing information about *Hygeia*, sample copies and other literature for distribution. Space required, an area 10 feet wide by 6 feet deep. Electrical connections, two outlets for shadow boxes, 120 watts. Shipping weight, about 300 pounds with literature.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

New Professor of Obstetrics.—Dr. Herbert F. Traut, associate professor of obstetrics and gynecology at Cornell University Medical College, New York, has been appointed professor of gynecology and obstetrics at the University of California Medical School, San Francisco. Dr. Traut graduated at Johns Hopkins University School of Medicine, Baltimore, in 1923; he has been associate professor at Cornell since 1931.

Annual Symposium on Cardiovascular Disease.—The Los Angeles Heart Association will hold its twelfth annual symposium at the Los Angeles County Hospital and the Los Angeles County Medical Association November 12-13. On Thursday evening, at a joint dinner meeting with the Southwestern Pediatric Society, Dr. Louis E. Martin, Los Angeles, will deliver his presidential address and Dr. Thomas Duckett Jones, Boston, will discuss "Rheumatic Fever and Rheumatic Heart Disease." Among the speakers on the program will be:

Dr. R. Eugene Levine, Los Angeles, The Heart and Circulation in Diphtheria.
Dr. John M. Askey, Los Angeles, The General Practitioner and His Choice of a Digitalis Preparation.
Dr. Morris H. Nathanson, Los Angeles, Practical Use of Adrenalin and Related Compounds in Cardiovascular Disease.
Drs. Hugh A. Edmondson and Harold J. Howie, Los Angeles, Rupture and Other Complications of Myocardial Infarction.
Dr. Clara Margules, Los Angeles, Collateral Circulation in the Human Heart.
Dr. Meinderd Brandsma, Beverly Hills, New Methods in the Treatment of Bacterial Endocarditis.

DISTRICT OF COLUMBIA

Shorter Hospital Period After Child Birth.—A plan has been placed in effect in Washington hospitals whereby mothers are being urged to shorten their stay at hospitals following child birth, newspapers reported October 10. The increased number of obstetric cases which have crowded Washington hospitals, already overburdened by the wartime increase in population, has reached such proportions that hospitals are urging mothers to return home with their newborn babies, sometimes within one day after birth, to vacate beds for more cases, it was stated. The plan, when thoroughly working throughout the city, probably will increase the maternity facilities by 20 to 25 per cent. Live births have been on the increase since 1935, when they totaled 10,803. In 1940 there were 15,309 and in 1941 18,294. There were 6,582 births in the first four months of 1942.

ILLINOIS

Illinois Health Conference in St. Louis.—Dr. Edward S. Godfrey Jr., New York State commissioner of health, Albany, will speak at the dinner of the Illinois Public Health Association at the New Jefferson Hotel, St. Louis, October 26, on "Public Health in Illinois a Generation Ago." The speakers at the conference on public health at the Municipal Auditorium in the afternoon will be Dr. Roland R. Cross, Springfield, health officer of Illinois; Dr. Mark V. Ziegler, Chicago, "Local Public Health Administration"; Frederic C. Woodward, LL.D., Chicago, "Illinois Statewide Public Health Committee"; Clair E. Turner, Dr.P.H., Boston, "Mobilizing Local Leadership for Public Health," and Dr. Huntington Williams, Baltimore, "Blitz Medical Services in England and What They Teach Us." The meeting of the Illinois group is a feature of the annual session of the American Public Health Association.

Chicago

Course in Industrial Medicine.—Loyola University School of Medicine is offering a course to meet the practical needs of the nurses employed in industry. The U. S. Public Health Service is financing the course, which will consist of twelve lectures beginning November 2 and ending January 25 covering orientation in industrial health, records and their use, compensation laws, problems of women in industry, use of community resources, diet and nutrition, mental hygiene, first aid, safety programs in industry, major causes of illness, control program and the evaluation of the industrial health program.

Research in Brief Psychotherapy.—The first research meeting of the newly formed Council for Research in Brief Psychotherapy will be held at the Institute for Psychoanalysis in Chicago, October 25-26. The types of cases treated, technics employed, therapeutic results and recording research material on brief psychotherapy will be the theme of discussions. The council was formed at a meeting in Boston in May under the auspices of the Institute for Psychoanalysis. Members of the committee of the council are Drs. Franz G. Alexander, chairman; Arthur H. Ruggles, Providence, R. I.; Robert P. Knight, Topeka, Kan.; George E. Daniels, New York; Francis J. Gerty, Chicago; Fanny von Hann-Kende, New York; John C. Whitehorn, Baltimore; David M. Levy, New York; David Slight, Chicago; Nolan D. C. Lewis, New York; Major Roy R. Grinker, and members of the staff of the Institute for Psychoanalysis.

Institute on War Medicine for Dentists.—The Chicago Dental Society will present an institute of war medicine and surgery for dentists at the John B. Murphy Memorial Hall October 26-29. Among the speakers will be:

Lieut. Walter A. Maclinn, U. S. Army, The Feeding of the American Soldier.
Clay G. Huff, Sc.D., Chicago, Tropical Medicine.
Dr. Harry A. Oberhelman, Chicago, The Principles of Traumatic Surgery.
Major W. H. Weir, U. S. Army, Boston, Military Sanitation.
Dr. Walter Wilkins, Washington, D. C., Nutrition in Wartime.
Lieut. D. D. Jackson, D. C., U. S. Navy, The Experience of a Dental Officer on the U. S. S. *Yorktown*.
J. Ben Robinson, D.D.S., Baltimore, The Role of the Dental Profession in the War Effort.
Percival C. Lowery, D.D.S., Detroit, The Use of Acrylics in the Construction of Splints and in Maxillofacial Prosthesis.
Arthur H. Bulbulian, D.D.S., Rochester, Minn., Facial Reconstruction.
Glenn E. Willhelmy, D.D.S., Kansas City, Aviation Splints.
John Jacob Posner, D.D.S., New York, Local Anesthesia Under War Conditions.
W. Harry Archer, D.D.S., Pittsburgh, General Anesthesia Under War Conditions.
Kurt H. Thoma, D.M.D., Boston, Traumatic Surgery of the Jaws.

KENTUCKY

Changes in Health Officers.—Dr. Martin H. Skaggs, Taylorsville, was recently elected health officer of Shelby County, September 8. The county health unit was opened officially on July 1.——Dr. Theodore E. Hynson, formerly of Dover, Del., has been appointed health officer of Harlan County.

Society News.—Dr. Oscar E. Bloch Jr., Louisville, delivered an essay entitled "Water Balance in Disease" before the Louisville Society of Medicine recently.——Dr. Andre Crotti, Columbus, addressed the Jefferson County Medical Society in Louisville, October 19, and showed a motion picture on "Physiologic Reactions in Operations of the Abdomen, Chest and Brain."——The Louisville Society of Medicine was addressed October 1 by Dr. John P. Forsee, Louisville, on "Chronic Fatigue."

State Medical Election.—Dr. Caswell C. Turner, Glasgow, was chosen president-elect of the Kentucky State Medical Association at its annual meeting in Louisville October 1 and Dr. E. Murphy Howard, Harlan, was inducted into the presidency. Vice presidents are Drs. Oscar O. Miller, Louisville; Charles L. Sherman, Millwood, and D. Hunter Coleman, Harrodsburg. Dr. Ben Wilson Smock, Louisville, was chosen to give the oration in surgery in 1943 and Dr. Charles B. Stacy, Pineville, the oration in medicine.

LOUISIANA

Tropical Medicine at Tulane.—Twelve Latin American physicians started the course in tropical medicine at Tulane University of Louisiana School of Medicine, New Orleans, in September under fellowships financed by the American Foundation for Tropical Medicine. They are Drs. M. Sanchez Basseres, Brazil; M. A. Cardenas, Chile; Benjamin Mera, Colombia; Alejandro Gonzalez L., Costa Rica; Gilberto Gomez R., Dominican Republic; Alfonso Marchan, Ecuador; Jose Pacas M., El Salvador; Jose Bustos, Mexico; Silvestre Lopez Portillo, Mexico; Carlos Calera M., Panama; Jorge Clavier, Venezuela, and Tulio Briceno, Venezuela. Dr. L. Everard Napier, director of the Calcutta School of Tropical Medicine and editor of the *Indian Medical Gazette*, recently accepted a visiting professorship in the department of tropical medicine and is expected to join the staff early in 1943. During the past spring and early summer the staff of the department of tropical medicine gave intensive night courses in tropical medicine to physicians in the military forces stationed in New Orleans. Ernest C. Faust, Ph.D., head of the division and director of laboratories of tropical medicine at Tulane and consultant to the Secretary of War on tropical diseases and on epidemic diseases, lectures every two months at the Army Medical School,

Washington. Drs. Faust and Joseph S. D'Antoni, assistant professor of the department, are collaborating with the division of medical sciences of the National Research Council in lecturing on tropical medicine at medical schools in the East and North during October and November. In 1941 the General Education Board of the Rockefeller Foundation gave $200,000 to enlarge the personnel of the department and to plan for a more permanent teaching program for undergraduate and postgraduate work in the field. Since 1940 the American Foundation for Tropical Medicine has provided an annual sum of $9,000 for postgraduate teaching, particularly for a special intensive course for Latin American physicians. This year two fellowship grants have been made available for the North American physicians by the Lambert Pharmacal Company, St. Louis, and the Winthrop Chemical Company, New York. Since 1940 the Eli Lilly Company has provided a yearly grant of $5,000 for unrestricted research carried out under the auspices of the department. Under the program the physician receives intensive training both in laboratory and in clinical tropical medicine in addition to review work in the general field of medicine; additional training is provided by special guest lecturers who are experts in their respective fields.

MARYLAND

Chest Clinics.—The state department of health announces its regular series of chest clinics for the fall and winter of 1942 and 1943. The clinics are conducted under the joint auspices of the state health department and the state tuberculosis association and are made possible through the sale of Christmas seals. In 1941 there were 352 clinics attended by more than 7,000 patients, 500 of whom were admitted to the tuberculosis sanatorium for treatment. The clinics reached every section of the counties at least once. The patients were referred by their own physicians or were discovered by the county health officers and public health nurses in connection with various other services. In connection with the clinic services, public health nurses paid more than 11,000 visits to the homes of the patients in 1941.

Bacteriologic Seminars.—The weekly bacteriologic seminars arranged by the bureau of bacteriology of the state department of health for the review of current literature, discussion of laboratory procedure and advances in research were resumed for the season October 1 with a talk by John Brewer, Ph.D., Baltimore, on "Problems Involved in the Sterilization of Sulfonamides." Dr. Milton S. Sacks, Baltimore, spoke October 15 on "Relationship of the Rh Factor to Intro-Group Hemolytic Transfusion Reactions and Pathogenesis of Erythroblastosis Foetalis." Others in the series will be:

Thomas C. Grubb, Ph.D., Baltimore, The Electron Microscope, November 5.
Ethalinda Brower, A.B., Baltimore, Immune Response to Tetanus Toxoid, November 19.
Dr. Thomas B. Turner, Baltimore, How Can the Laboratory Cooperate in the War Effort, December 3.
Justina H. Hill, D.Sc., Baltimore, Gonococcus Culture Methods, December 17.
Dr. John J. Phair, Baltimore, Epidemic Meningitis, January 17.
Harriette D. Vera, Ph.D., Baltimore, Demonstration of Hemolysis Due to Anaerobes, January 20.

These seminars were started in 1936 and have been continued each season since then as a part of the regular education program of the bureau of bacteriology.

MICHIGAN

Lectures on Nutrition.—A series of lectures on nutrition in medicine, dentistry and industry has been arranged by the Wayne County Medical Society, Detroit District Dental Society, Detroit Physiological Society, Detroit Pediatric Society and the Engineering Society of Detroit. The first in the group was given on October 12 by Dr. Tom D. Spies, Cincinnati, Ohio, and Birmingham, Ala., on "Recent Advances in Vitamin Research." Subsequent lectures will be:

Dr. Ewing C. McBeath, New York, October 29, Nutrition and Dental Health.
Dr. Anton J. Carlson, Chicago, November 19, What's Wrong with America's Diet?
Dr. Frederick F. Tisdall, Toronto, December 14, Nutrition in Everyday Practice.
Dr. Robert S. Goodhart, Forest Hills, N. Y., January 15, Importance of Nutrition in Prevention of Industrial Injury.

Sponsors of these lectures, which emphasize the significance of nutrition in the fields of medicine, dentistry and industry, are the University of Michigan Medical School, Ann Arbor, Wayne University College of Medicine, Wayne County Nutrition Committee and the Children's Fund of Michigan.

NEW YORK

Society News.—The Medical Society of the State of New York arranged a lecture on war medicine and surgery for the Cortland County Medical Society in Cortland, October 6. Dr. Leon E. Sutton, Syracuse, was the speaker; his subject was "Healing in Large Deep Burns."

Director of War Nutrition Services.—Dr. Edward S. Rogers, Albany, acting assistant commissioner for medical administration of the New York State Department of Health, has been appointed director of the Office of War Nutrition Service of the New York State War Council. He will direct the work of all the departments and agencies of government to the extent that they are concerned with problems related to nutrition. Dr. Alvin A. Florin, Woodmere, assistant district health officer, has been assigned to assist Dr. Rogers full time.

Teaching Day on Chemical Warfare.—Syracuse University College of Medicine, in cooperation with the health preparedness commission of the State War Council and the state medical society, sponsored a teaching day on medical aspects of chemical warfare in Binghamton, October 15. Dr. Oliver W. H. Mitchell, Syracuse, gave the introductory remarks. Neal E. Artz, Ph.D., Syracuse, discussed "General Aspects and Chemistry" with demonstrations on "Identification of Chemical Agents" and "Use of Gas Mask." Dr. John Howard Ferguson, Syracuse, gave a pathologic demonstration and Drs. Herbert C. Yeckel, George S. Reed and David F. Gillette, Syracuse, spoke on "Prevention, Diagnosis and Treatment of Chemical Casualties."

New York City

Annual Harvey Lectures Begin.—Vincent du Vigneaud, Ph.D., professor of biochemistry, Cornell University Medical College, will deliver the first Harvey Society Lecture of the current series at the New York Academy of Medicine October 29, on "The Significance of Labile Methyl Groups in the Diet and Their Relation to Transmethylation."

Chest Examination for Nursery Personnel.—Of 338 nurseries and nursery schools receiving invitations from the city department of health for free chest examinations, 60 have already replied during the first week of the campaign to detect tuberculosis among the personnel of these nurseries and nursery schools. The campaign was started at this time because it was felt that there was a special need during the war, when an added number of children are being placed in nurseries by mothers taking war jobs.

Tuition Fee Reduced in Course on Industrial Medicine.—Long Island College of Medicine, Brooklyn, announces a postgraduate course in industrial medicine November 2-13. A limited number of "internships" of one month's duration in medical departments of industrial establishments will be available for those who wish additional training. The fee for the course has been reduced from $75 to $50. A special dinner forum will be held November 2 on "Industrial Health and the War Effort." Cyrus S. Ching, director of industrial and public relations, U. S. Rubber Company, will be the speaker.

Dr. Wortis Named Littauer Professor of Psychiatry.—Dr. Samuel Bernard Wortis, associate professor of neurology at the New York University College of Medicine, has been appointed the first Lucius N. Littauer professor of psychiatry and visiting neuropsychiatrist in charge of the psychiatric division of Bellevue Hospital, effective October 1. The chair of psychiatry at the medical school has been vacant since the resignation of Dr. Karl M. Bowman to become director of the Langley Porter Clinic in San Francisco. It has now been named the Lucius N. Littauer professorship in honor of the philanthropist who established last year a fund of nearly $250,000 "for research in psychiatry, neurology and related fields, in order to increase and diffuse knowledge of the biological and other factors which influence thought and conduct; and thereby to prevent and correct abnormal human behavior through clinical and experimental approaches." Mr. Littauer had previously given the university nearly $120,000 for research studies in the prevention and cure of pneumonia, for research studies of venereal disease and for scholarships and fellowships in the college of medicine, Washington Square College of Arts and Sciences, the college of dentistry and other divisions of the university. Dr. Wortis graduated at Cornell University Medical College in 1927. He has been a member of the medical faculty of New York University for eleven years.

Institute of Inter-American Affairs.—Columbia University and the NBC Inter-American University of the Air sponsored an Institute of Inter-American Affairs October 10-12 on the occasion of the four hundred and fiftieth anniversary of

the discovery of the Americas. The sessions were devoted to consideration of the following topics: the Americas: a model for world cooperation, new world music, the rediscovery of America, military cooperation among the Americas, audiovisual aids to cultural understanding, health problems of the Americas, post war relation of the Americas, American cultural relations and a cavalcade of America. One session on health problems of the Americas was addressed by Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, chairman; Dr. Joao Jacques Dornelles, Brazilian member of the Pan American Sanitary Bureau and now a resident at the Memorial Hospital for the Treatment of Cancer and Allied Diseases; Colonel Albert R. Dreisbach, M. C., U. S. Army, Washington, D. C., medical division, Office of the Coordinator of Inter-American Affairs; Dr. John R. Murdock, Panama, Pan American Sanitary Bureau, and Dr. Wilbur A. Sawyer, director, International Health Division, Rockefeller Foundation.

OHIO

The Rachford Lectures.—Dr. Hattie E. Alexander, New York, will deliver the eleventh annual series of the Benjamin Knox Rachford Lectureships in the Children's Hospital Clinic and Research Building, Cincinnati, November 12-13. Dr. Alexander's subjects will be "Experimental Basis for Treatment of Hemophilus Influenzae Infections" and "Treatment of Hemophilus Influenzae Infections and of Pneumococcic and Meningococcic Meningitis."

Course on Military Neuropsychiatry.—The department of psychiatry at the University of Cincinnati College of Medicine opened a fourteen week course on military neuropsychiatry October 23. Dr. Charles E. Kiely, Cincinnati, gave the first lecture on "Neuropsychiatric Experiences in World War I." Others in the series are:

Dr. Philip E. Piker, Cincinnati, October 30, Induction: Neurologic Problems.
Dr. Charles D. Aring, Cincinnati, November 6, Induction: Neurologic Problems.
Virginia T. Graham, Ph.D., Cincinnati, November 13, Induction: Psychologic Problems (Illiteracy and Mental Deficiency).
Major Kenneth G. Moore, M. C., U. S. Army, Fort Worth, Texas, Military Laws and Regulations Concerning the Disposition of Psychiatric Patients.
Dr. Milton Rosenbaum, Cincinnati, November 27, Psychiatric Problems in Noncombat Military Activity.
Dr. Maurice Levine, Cincinnati, December 4, Psychiatric Problems in Combat Activity.
Dr. Joseph P. Evans, Cincinnati, December 18, Craniocerebral Injuries.
Dr. Eugene B. Ferris Jr., Cincinnati, January 15, Certain Problems of Aviation Medicine.
Dr. Leon Goldman, Cincinnati, January 22, Certain Problems of Gas Warfare.
Dr. John Romano, Cincinnati, January 29, Some Effects of Modern Warfare on Civilian Population.

OKLAHOMA

Clinical Conference.—The Oklahoma City Clinical Society will hold its twelfth annual fall conference at the Hotel Biltmore, October 26-29. The program will include general assemblies, postgraduate symposiums and round table discussions. The annual dinner Tuesday evening will be given by the local chamber of commerce. Dr. James E. Paullin, Atlanta, Ga., President-Elect of the American Medical Association, will be the guest of honor. Guest speakers at the conference will include:

Dr. Isaac A. Bigger, Richmond, Va., surgery.
Dr. George M. Curtis, Columbus, Ohio, surgery.
Dr. Frank H. Ewerhardt, St. Louis, physical therapy.
Dr. Frederick H. Falls, Chicago, obstetrics.
Dr. Charles C. Higgins, Cleveland, urology.
Dr. Sara M. Jordan, Boston, internal medicine.
Dr. John Albert Key, St. Louis, orthopedics.
Dr. Byrl R. Kirklin, Rochester, Minn., radiology.
Dr. Andrew W. McAlester, Kansas City, ophthalmology.
Dr. Donovan J. McCune, New York, pediatrics.
Dr. Frank J. Novak Jr., Chicago, otolaryngology.
Dr. Albert O. Singleton, Galveston, Texas, surgery.
Dr. Tom D. Spies, Cincinnati, Ohio, and Birmingham, Ala., internal medicine.
Dr. Howard C. Taylor Jr., New York, gynecology.
Dr. Willard O. Thompson, Chicago, internal medicine.
Dr. Eugene F. Traub, New York, dermatology.

OREGON

State Medical Election.—Dr. Thompson Coberth, The Dalles, was named president-elect of the Oregon State Medical Society at its annual session in Portland, September 13, and Dr. George E. Henton, Portland, was installed as president. Other officers include Drs. Edward H. McLean, Oregon City, Raymond M. McKeown, Marshfield, and John R. Montague, Portland, vice presidents. Dr. Thomas D. Robertson is secretary and Dr. James E. Buckley, Portland, treasurer.

PENNSYLVANIA

Society News.—Dr. Michael M. Wolfe, Philadelphia, addressed the Schuylkill County Medical Society at Reading, September 8, on plastic surgery.——Dr. Albert E. Russell, New York, discussed "Problems of Civilian Medical Service in War Times" before the Cambria County Medical Society in Johnstown October 8.

Philadelphia

Alvarenga Prize Lecture.—The third Alvarenga Prize Lecture was delivered before the College of Physicians of Philadelphia and the Philadelphia County Medical Society, October 14, by Edwin J. Cohn, Ph.D., professor of biologic chemistry and head of the department, Harvard Medical School, Boston. His subject was "The Plasma Proteins: Their Properties and Functions."

WASHINGTON

New Industrial Hygiene Unit.—The Washington State Department of Health and the U. S. Public Health Service cooperated in the establishment of an industrial hygiene division October 1. The new division will be housed in the same office building as the state department of health.

State Medical Election.—Dr. Verne W. Spickard, Seattle, was chosen president-elect of the Washington State Medical Association and Dr. Albert P. Duryee, Everett, was inducted into the presidency. Other officers include Drs. Herbert E. Coe, Seattle, vice president, and Albert J. Bowles, Seattle, secretary-treasurer. The society has canceled future sessions until further notice.

Appointments to State Board of Health.—Dr. Harold L. Lawrence, Seattle, passed assistant surgeon of the U. S. Public Health Service, has been appointed chief of the division of epidemiology and venereal disease control of the Washington State Department of Health, Seattle. Dr. Cedric Northrop, a member of the state department of health since December 1941, has been appointed chief of the division of tuberculosis control. Dr. Arthur E. Lewis, U. S. Public Health Service Reserve, has been assigned to Washington as assistant state medical officer for civilian defense.

GENERAL

American College of Surgeons Cancels Meeting.—The annual Clinical Congress of the American College of Surgeons which was scheduled to be held in Cleveland November 17-20 was canceled by the board of regents of the college at a meeting in Chicago October 14.

Southern Psychiatric Meeting Postponed.—The annual sessions of the Southern Psychiatric Association will be postponed for the duration of the national emergency. The roster of officers and members will be frozen and all dues suspended until the emergency has passed. In the meantime Dr. Newdigate M. Owensby, Atlanta, Ga., secretary-treasurer of the association, requests that he be kept informed of any change in address of members and be advised of all matters pertaining to the welfare of the association. The 1942 meeting was to be held in Richmond, Va., November 6-7.

Aero Medical Association.—Dr. Harold R. Bohlman, Baltimore, was chosen president-elect of the Aero Medical Association of the United States at its annual meeting in Indianapolis, September 3-5, and Major William R. Lovelace II, Wright Field, Ohio, U. S. Army, was inducted into the presidency. Dr. David S. Brachman, Detroit, was reelected secretary. Included on the scientific program at the recent meeting were:

Dr. J. R. Delucchi, captain, Argentine Military Aviation, Republic of Argentina, Effects of Obstructing Blood Vessels and of Muscular Effort on Total Ventilation: Its Importance in Aviation.
Dr. Walter M. Boothby, Rochester, Minn., Recent Research in the Mayo Aero Medical Unit.
Lieut. Col. David B. Dill, Ph.D., Aero Medical Research Laboratory, Wright Field, Dayton, Ohio, Man's Ceiling as Determined by Low Pressure Chamber Tests.
A. H. Bulbulian, D.D.S., Rochester, Minn., Visualization of the Alveoli of the Lung by Metal Injection and Corrosion Method.
Col. Eugen I. G. Reinartz, Randolph Field, Texas, Neuropsychiatric Aspects of Aviation Medicine.
Major Emerson M. F. Weaver, Randolph Field, Importance of Vision in Flight.

Rehabilitation Council Formed.—At a meeting of the American Physiotherapy Association in New York in August a permanent council was formed to serve as an "observation post" for member agencies and as a channel for communication with federal and state agencies and with each other. The objective is to aid in the rehabilitation of members of the armed forces and of civilians. Dr. Philip D. Wilson, New York, was elected chairman and Col. John N. Smith Jr., New

York, director of the Institute for the Crippled and Disabled, vice chairman. Membership in the council is available to national associations interested in rehabilitation on election by the executive committee, which is composed of Harry H. Howett, National Society for Crippled Children; Holland Hudson, New York, director of rehabilitation, National Tuberculosis Association; Evelyn C. McKay, New York, American Foundation for the Blind; Major Julia C. Stimson, army nurse corps, U. S. Army, New York, American Nurses Association, and Dr. George H. Stevenson, New York, American Psychiatric Association. The work of the council is to be financed by means of registration fees from member organizations.

Academy of Pediatrics.—The American Academy of Pediatrics will meet in annual session at the Palmer House, Chicago, November 4-7, under the presidency of Dr. Edward C. Mitchell, Memphis, Tenn. There will be clinics at the Children's Memorial, Bobs Roberts Memorial, Michael Reese and Presbyterian hospitals. There will be a symposium on virus diseases with Jacques J. Bronfenbrenner, D.P.H., St. Louis, as chairman and one on pediatric gynecology with Dr. Goodrich C. Schauffler, Portland, Ore., as chairman. Panel discussions will be held on growth and development and allergy and immunotherapy with Drs. Joseph A. Johnston, Detroit, and Bret Ratner, New York, as chairman, respectively. Roundtable discussions will include the following topics: adolescence, dermatologic conditions in children, sinusitis and colds, the newborn, mental health problems in children, bronchial asthma, chemotherapy, posture and flat feet, abdominal diseases (x-ray interpretation), nutrition and deficiency diseases, diseases of the central nervous system, the Kenny treatment of poliomyelitis, prophylaxis and treatment of communicable diseases, prescribing of drugs and tropical diseases. A special session will be addressed by Dr. Frank G. Boudreau, New York, Thursday evening on "Medicine in the Post War World," and Sister Kenny will conclude the meeting with a demonstration on her treatment of poliomyelitis.

Association of Military Surgeons.—The annual meeting of the Association of Military Surgeons will be held at the Gunter Hotel, San Antonio, Texas, November 5-7, under the presidency of Col. James A. Mattison, Glendora, Calif. The tentative program lists the following speakers:

Major Gen. James C. Magee, M. C., U. S. Army, Washington, D. C., An Appraisal of the Medical Department at War.
Capt. William L. Mann, M. C., U. S. Navy, Washington, D. C., Basic Principles Involved in the Plans and Arrangements of the Navy Medical Service.
Dr. Knox E. Miller, Fort San Houston, Texas, The Contribution of the Public Health Service Toward War Activities in the Territory of the Eighth Service Command.
Dr. Charles M. Griffith, Washington, D. C., Medical and Hospital Service Experience with Disabled Veterans of World War II.
Major Gen. Charles R. Reynolds, M. C., U. S. Army, Ret., Harrisburg, Pa., Medical and Epidemiological Follow-Up of Selective Service Men Rejected for Military Service.
Brig. Gen. Addison D. Davis, M. C., U. S. Army, Carlisle Barracks, Pa., Work of the Medical Field Service School.
Col. Leonard G. Rowntree, Washington, D. C., Selective Service System —Wartime Problems of Selective Service.
Col. Frank S. Gillespie, British Army Medical Service, Medical and Surgical Experiences of the British Army in the Middle East.
Dr. Neil D. Buie, Marlin, Texas, The Work of the State Medical Association of Texas on Procurement and Assignment Service for Doctors, Dentists and Veterinarians.
Brig. Gen. Robert H. Mills, D. C., U. S. Army, Dental Corps Increases Its Responsibility.
Brig. Gen. Raymond A. Kelser, V. C., U. S. Army, The Role of Veterinary Service in War.
Col. Julia Flikke, Army Nurse Corps, The Army Nurse Corps in Time of War.
Brig. Gen. David N. W. Grant, Washington, D. C., Army Air Forces, Medical Service with Air Forces in the World War II.
Col. Albert W. Kenner, M. C., U. S. Army, Washington, D. C., Medical Service with the Armored Forces.
Lieut. Ralph P. Creer, U. S. Army, Washington, D. C., Medical Illustration in the United States Army.

Physical Status of NYA Youths.—According to a report released recently by the U. S. Public Health Service and the National Youth Administration, nine tenths of the youths from ages 16 to 24 in low income families are in need of medical or dental care. Two thirds of these young people, however, are physically fit for any kind of work. These findings are based on about 150,000 complete physical examinations of out of school youths on work programs of the National Youth Administration. This group of young people is believed to be representative of about twelve million American youths from low income families. As compared with other groups of the same ages, the general health of NYA youths is much the same as that of all American youths, but NYA young people have received less corrective attention for remediable defects, such as decayed teeth, than have other groups. The physical examinations were made by local physicians and dentists and included an evaluation of each youth's employability in terms of his health status. According to the recommendations of the examining physicians and dentists, about one hundred and eighty-five health defects in each hundred youths require medical or dental attention. Untreated dental caries was recorded for 83 per cent of the individuals who were examined by a dentist. The average number of untreated defective teeth per hundred youths was 472, or about 5 defective teeth per person. Over one third of the youths had defective vision, but most of the visual defects were slight. More than one in ten were 15 per cent or more below the average weight for their age, sex and height; over 5 per cent weighed 25 per cent or more above the average. Negro youths were found to have a lower rate of total carious teeth. Youths in certain geographic regions, notably the Rocky Mountain and West South Central census regions, had significantly higher rates of dental caries. Prevalent rates of defective vision were higher for females than for males, and higher for white children than for Negroes. The 150,000 physical examinations included blood-serologic examination, urinalysis, stethoscopic examination, dental examination, Snellen chart reading, ear, nose and throat examination and in some cases chest roentgenograms and fecal examinations.

Southern Medical Association.—The annual meeting of the Southern Medical Association will be held at the Hotel John Marshall, Richmond, Va., November 10-12, under the presidency of Dr. Marcus Pinson Neal, Columbia, Mo. At the general session Tuesday evening Dr. Perrin H. Long, Baltimore, will be presented with the association's research medal "in recognition of his outstanding contributions to the knowledge of bacteriology and chemotherapy." Dr. Neal will deliver his presidential address on "The Unknown Man in Medicine." Among the speakers on the program will be:

Dr. John Shelton Horsley, Richmond, Recent Advances in the Study of Cancer.
Dr. Charles R. Robbins, Richmond, The Relation of the Conjoint Tendon to the Permanent Cure of Inguinal and Femoral Hernia.
Dr. Lee E. Sutton Jr., Richmond, Acute Respiratory Obstruction in Infants and Children.
Lieut. Col. Henry M. Thomas Jr., M. C., U. S. Army, Atlanta, Ga., Peptic Ulcer in the Army.
Dr. Robert L. McMillan, Winston-Salem, N. C., Ventricular Tachycardia as a Therapeutic Problem in Coronary Thrombosis.
Dr. Robert Wilson Jr., Charleston, S. C., Acute Hemolytic Anemia in Fertilizer Workers: A New Industrial Hazard.
Dr. Haven Emerson, New York, Progress Against Bacillary Dysenteries.
Dr. William Henry Sebrell Jr., Bethesda, Md., Foods and Their Importance to the War Effort.
Lieut. Col. Baldwin H. E. W. Lucke, M. C., U. S. Army, Washington, D. C., The Pathology of Epidemic Hepatitis.
Dr. Frederick O. Coe, Washington, D. C., Traumatic Lesions of the Urinary Tract.
Major Leon H. Warren, M. C., U. S. Army, Bethesda, Md., Patch Tests: Their Practical Applications and Limitations.
Dr. Francis M. Rackemann, Boston, The Natural History of Asthma.
Dr. Ernest Rupel, Indianapolis, Prostatic Cancer: An Evaluation of Treatment by Castration.
Dr. Lawrence Chester McHenry, Oklahoma City, Some Observations on the Maxillary Sinuses.
Dr. Clyde A. Clapp, Baltimore, Compensatory Divergent Strabismus: Its Etiology and Treatment.
Dr. Russell F. Bonham, Houston, Texas, The Changing Status of Anesthesia in Civilian Practice During the War.

A feature of the meeting will be a symposium on gastroenterology in relation to the war. Included among the groups meeting during this period are the National Malaria Society, the American Society of Tropical Medicine, the American Academy of Tropical Medicine, the Southern Branch of the American Public Health Association and Region Two of the American Academy of Pediatrics. The Woman's Auxiliary to the Southern Medical Association will be addressed by Dr. William W. Bauer, Director of the Bureau of Health Education of the American Medical Association, Chicago, on the "American Standard of Health." Another feature of the Southern Medical Association meeting will be the Officers' Wartime Luncheon on Wednesday, which will be addressed by Dr. James E. Paullin, Atlanta, Ga., President-Elect of the American Medical Association, on "The Value of Medical Organizations in the War Effort."

CORRECTION

Scranton Mothers in War Industries.—Dr. Hubley R. Owen, director of the Philadelphia Department of Health, reports that the news item entitled "Scranton Mothers in War Industries" published in THE JOURNAL, September 19, page 215, was in error, and that no such program is under way in Scranton. The source of the news item in THE JOURNAL was the Washington *Evening Star* of September 1.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 12, 1942.

Good Health of the Nation Notwithstanding the War

As reported from time to time in previous letters, the health of the nation has not only remained good in spite of the war but in some ways even shown improvement. This heartening report is once again confirmed. At a press conference the chief medical officer to the Ministry of Health said that provisional figures supplied by the registrar general showed that the death rate for the June quarter would be the lowest for any June quarter except in 1927, 1930 and 1933 and that the infant mortality would be the lowest for any June quarter except that of 1940. The number of cases of typhoid in the period January to August 1939 was 701. In 1940 it rose to 1,452 and in 1941 to 2,539. But in the present year it fell to 531. Cases of cerebrospinal fever, which numbered 10,024 in 1940 and 8,645 in 1941, were reduced this year to 4,766. The campaign against diphtheria had been a conspicuous success. Already 3 million children under 14, out of a total of 8¼ millions, have been inoculated. The vigilance of the medical authorities in all parts of the country is exemplified by the prompt measures taken recently in Glasgow to stamp out an outbreak of smallpox. A virulent oriental type was brought to that city in a ship. There were 41 cases and 8 deaths. All the cases except 4 occurred in Glasgow. The cases were traced and infection was combated by vaccination. The risks were tremendous, but it looked as though the epidemic had petered out. It was just over three weeks since the case which occurred in London had been notified.

Treatment of Burns of the Eyes in Wartime

The treatment of burns assumes a special importance in wartime. The Emergency Medical Services in Scotland have issued a memorandum which was compiled by a committee of leading surgeons with Sir John Fraser as chairman. In regard to burns of the eyes, they state that in burns of the face the eyelids frequently afford complete protection, so that only the surfaces of the lids require treatment. Coagulation methods are not suitable for the eyelids or for application to the skin over the malar region, as contraction of the coagulum may cause the lids to be drawn away from the eyeball with production of "exposure keratitis" and perhaps loss of a previously uninjured eye. In many cases the burns are superficial and require only application of sterile petrolatum. But if they are deep, glycerin-sulfonamide paste is preferable. This should be spread on thickly on sterile lint or gauze in the form of a face mask.

When the eye is involved, the essential part of treatment is rapid and efficient first aid, which should be confined to instillation of liquid petrolatum drops. Burns of the eye may cause severe damage by injuring the cornea and producing adhesions between the eyeball and the lids. To prevent these the conjunctival sac should be irrigated with isotonic solution of sodium chloride without delay. If this is not available, tepid water should be used. A few drops of a local anesthetic, such as 3 per cent cocaine hydrochloride, should then be instilled and the upper lid everted. In burns due to lime, particles are often found adherent to the under surface of the upper lid and must be removed. If the burn is due to acids or alkalis, irrigation must be thorough and prolonged, at least 200 cc. being used for each eye. Spasm of the lids and edema of the conjunctiva may render examination difficult. The use of lid retractors after instillation of a local anesthetic will then facilitate inspection. If, in addition, a few drops of a 2 per cent solution of fluorescein are instilled and then washed out with saline solution, the full extent of the damage becomes apparent.

Further treatment consists in the use of 1 per cent atropine sulfate drops twice daily (in all but the mildest cases) and instillation of 4 drops of liquid petrolatum every four hours. When atropine is used after middle life, the tension of the eye must be kept under observation. The eye should be covered with pad and bandage. If adhesions appear to be forming petrolatum should be packed into the conjunctival fornix with a glass rod with a smooth rounded tip.

When the burn is complicated by the presence of multiple foreign bodies, as in injuries by incendiary bombs, removal may be difficult. Such foreign bodies should be removed a few at a time, at intervals of a day or two, the eye being treated with atropine and liquid petrolatum or cod liver oil drops in the interval. Only nonirritant antiseptics, such as sulfacetamide 2.5 per cent or merthiolate 0.01 per cent, should be used, preferably in the form of an ointment. If a local anesthetic is required for the relief of pain, decicaine, percaine or metycaine may be used. Repeated instillations of cocaine are contraindicated on account of the deleterious effect on the corneal epithelium. Where a burn involves the eyelids or eyeball, an ophthalmic surgeon should be asked to see the case early.

Dried Vegetables for Troops at the Front

Scientists at the Low Temperature Research Station, Cambridge, have worked out a technic for drying vegetables under which they retain not only their taste and color but their nutritive value. The great merit of dried vegetables is their easier transportability. They enable men in the front line in Egypt to enjoy British potatoes, carrots and cabbage just as palatable and nutritious as when eaten at home. Indeed, it is claimed that they are more nutritious, for the utmost care is taken that they retain their minerals. Potatoes are peeled by machine and have blemishes and "eyes" removed. After washing they are shredded by a machine to small chips. They are then blanched by two minutes in boiling water and sudden cooling. They are next dried in a tunnel heated by steam. They are packed in tins from which all air is expelled and are replaced by nitrogen. The great compression achieved by drying is shown by the fact that the same shipping space will carry eight times as much potato, twenty times as much carrot and twenty to thirty times as much cabbage as in the fresh. The new process differs from drying fruit in the sun in that the essential nutritive elements are retained, and reconstitution with boiling water and cooking produces vegetables which look and taste as good as the fresh.

A Surgeon Helps to Save a Hospital

High explosive and incendiary bombs fell on a hospital, setting it on fire. The house surgeon, Dr. Philip Baxter, wearing a dressing gown over his pajamas, climbed a fall pipe to the blazing roof. Then he used the girdle of his dressing gown as a rope to hoist up buckets of water, which were tied on by helpers below. He got the blaze under control. In leaping from the roof to a lower one he injured an ankle but went to the operating theater to attend the victims of the raid. When there a message came that an elderly woman was trapped under wreckage in another part of the town and that medical help was urgently needed. He went and had to crawl down a tunnel in the débris to administer morphine. He waited until she was extricated and sent to the hospital. He then hobbled back but was in great pain. While on his way a policeman lent his bicycle. Cycling was no less painful but was quicker. On arrival he returned to the operating theater and continued his work. Only after he had been on duty for several hours did his own injury receive attention. His work helped to save the building from destruction.

New German Phosphorus Bomb

The Ministry of Home Security has issued the following advice with regard to the new German phosphorus fire bomb: Remember that phosphorus cannot burn when wet but bursts into flame as soon as it is dry. If you are splashed with burning phosphorus, keep the affected part under water or covered with a wet pad until medical treatment is available. If you can, bathe the burn with a solution of 2 tablespoons of washing soda dissolved in a pint of water. On no account should any oily or greasy dressings be put on a phosphorus burn before it is certain that no trace of phosphorus remains, because grease dissolves phosphorus and spreads it.

Killing People on the Roads

Speaking at a meeting of the Royal Society for the Prevention of Accidents, Mr. Neol Baker, parliamentary secretary to the Ministry of War Transport, said that on our roads we were doing the same kind of killing and maiming that had been done on the battlefield for countless centuries. It was not tolerable that in a civilized country we should go on with this. In ten years we had killed on the roads as many as were killed throughout the blitzes on this country. He hoped and believed that the law could be so improved and that we should find ways in which it would be easier for the police to receive evidence which they require for prosecutions.

The war, because of traffic changes and the blackout, has caused some increase of road accidents. However, the figures of the past month show an improvement. During June 437 persons were killed on the roads, compared with 618 in the same month last year, 2,688 were seriously injured, compared with 3,592, and 8,408 were slightly injured, compared with 11,593. In the blackout hours 31 were killed, compared with 41, 118 seriously injured, compared with 314, and 305 slightly injured, compared with 567. The improvement is due to increased precautions.

The killed included 99 pedestrians and 12 pedal cyclists under 15. There were 365 children seriously injured while walking and 134 while cycling, and 1,280 slightly injured while walking and 605 while cycling. Ninety-five pedestrians, 75 motor cyclists and 76 pedal cyclists, all over 15, were killed.

Surgeon's Heroism in the Sinking of an Aircraft Carrier

In the sinking of the aircraft carrier *Eagle* in the Mediterranean the heroism of a surgeon deserves mention. With the flight deck tilted at an extreme angle he found a man with both legs broken. Although the ship was likely to sink at any moment he administered morphine and then passed a bow line round his patient's shoulders. Hanging on precariously himself he lowered the man until he slid gently into the sea and was later picked up by a destroyer. The surgeon went into the sea just before the ship sank, still with a box of morphine tubes in his hand. He was picked up by a destroyer, but before he could change his wet clothing another ship drew alongside packed with survivors. Hearing that there were wounded on board, he climbed on and administered morphine to a man with a smashed upper arm and set the fracture.

"The Flying Nurse"

"The flying doctor" has been succeeded by "the flying nurse." A new force consisting of "flying nurses" is being built up by the Women's Auxiliary Air Force. Eventually a nurse will travel in every air ambulance. The crew of an air ambulance are pilot, observer and an orderly of the Women's Auxiliary Air Force. She sits on a wooden box at the head of the patient within reach of the oxygen apparatus. She carries a flask of water and another of warm milk and has a hypodermic syringe ready for the relief of pain. A medical officer meets the ambulance plane on landing to examine the patient and check his medical history. It has been found that the patients derive greater confidence and comfort from having a woman to look after them.

An American Appreciation

Dr. Virgil P. W. Sydenstricker, professor of medicine in the University of Georgia School of Medicine, who is carrying out investigations on nutrition in this country, stated that he had been agreeably impressed by the general appearance of well being. "My outstanding impression" he said, "is of the amazing and efficient job done by the Ministries of Food and Health in handling the situation." Provided the people used the food available properly, he saw no reason or excuse for trouble developing. Health officers in the areas he had visited informed him that the nutritional standard was better than before the war. This was no doubt due to increased employment and to the leveling out of the people's diet by rationing. He commended the scheme for the provision of school meals and milk for children.

BUENOS AIRES

(From Our Regular Correspondent)

Sept. 26, 1942.

Studies on Effects of Altitude

A law was recently passed by the senate which provides for the creation of an Argentine committee to take charge of the technical direction of studies on the effects of altitude. The committee will be a branch of the Ministry of Internal Affairs. It will be of an honorary character and consist of doctors of medicine, chemistry, physics and the natural sciences. The fields covered by the committee will be (1) studies of biologic problems in relation to most adaptable human biotypes, (2) working capacity, feeding, housing and climatologic, hydrologic, geologic, zoologic, botanic and physicochemical factors in relation to life of normal men in various altitudes, (3) pathology of altitudes, studies of diseases which may improve by hypsotherapy and the establishment of sanatoriums and hospitals in proper altitudes for the cure of certain diseases, (4) creation of portable laboratories and establishment of experimental hypsologic centers and (5) studies of the animals and plants of different regions, the constitution of the soil, and meteorologic phenomena. Two hundred thousand Argentine pesos ($50,000) was given by the Ministry of Internal Affairs to cover the expense of the studies. The motion for the creation of the National Committee of Altitudes was given by a group of research workers with Dr. Mariano R. Castex as head of the group. Their research was done on people who lived in the plateaus and highlands of Bolivia.

Antihemorrhagic Effect of Human Milk in Hemophilia

Drs. Mariano R. Castex and Alfredo Pavlovsky recently read a paper before the Academia Nacional de Medicina of Buenos Aires in which they reviewed the results of their research on the antihemorrhagic effect of human milk as reported by Solé of Vienna in 1935. It was observed that the substance which accelerates coagulation of the blood is suspended within the minute fat droplets in human milk. The authors found that coagulation is greatly accelerated in vitro when the cream of human milk is added to the blood of hemophilic patients. Coagulation is moderately accelerated when uncreamed human milk is added to blood, and it is not accelerated at all when cow's milk is used. They found that human milk, and especially the cream of human milk, contains a great amount of thromboplastic substance. Powdered milk, prepared by precipitation of milk with acetone, proved to be highly coagulating for blood. They isolated a precipitated fraction from human milk which was acidified with 1 per cent acetic acid solution by using the technic that Patek and Stetson used for isolating the globulin fraction from human plasma. They found also that fresh human

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milk, and especially the cream of fresh human milk, produces spontaneous coagulation of oxalated plasma. Preserved milk loses the strength of its coagulating power. However, it regains the thromboplastin-like power if calcium is added to it. Coagulation of oxalated plasma does not spontaneously occur when human milk is prepared with sodium oxalate. It occurs, however, if calcium is added to oxalated milk. The results indicated that the coagulating substance in human milk is thromboplastin. When blood plasma is deprived of prothrombin (by barium sulfate precipitation) human milk and its cream, alone or with calcium, does not coagulate blood plasma. The speakers reported good results from the use of the substance obtained from cream of human milk in controlling a dental hemorrhage in a hemophilic patient.

The Social Welfare of Children

Dr. Luis Siri, the subdirector of the Dirección Nacional de Maternidad e Infancia, recently reviewed the progressive increase in centers for the welfare of children. The increase was 0.17 per cent from 1870 to 1880, 2.5 per cent from 1910 to 1920, 2.74 per cent from 1920 to 1930 and 3.22 per cent in the last decade, in which 28,000,000 Argentine pesos ($7,000,000) was dedicated to this cause.

Dr. T. Reca de Acosta said that in Buenos Aires there are ninety-four centers for recreation, education and social care of children between 2 and 6 years. Sixty-five are supported either by the government or by private institutions. In twenty-nine private centers the parents pay for the care and education given to their children. In 1936 there were in Buenos Aires 138,210 children in the preschool age. The total capacity of the recreational centers for children in the city in 1940 was for a total of only 5,000 children. There are seventy-seven parks, in the proportion of one park for every 1,866 children if the figures of the 1936 census are considered. Research carried on in sixty-one educational and recreational centers during the year 1938 to 1939 revealed an average registration of 3,600 children in each center. In the majority of the centers breakfast, lunch and dinner were given to the children.

Tuberculosis in Peru

Dr. Ricardo Martinez of Lima recently published the results of his observations in Peru. A positive index to tuberculin was found in 68.45 per cent in conscripts, 65 per cent in school children of Callao province, 77.98 per cent among the applicants for entrance to Lima University and 95 per cent in the various groups of teachers and unions of workers. The percentage of positivity in conscripts had the following regional percentages: 74.64 per cent in conscripts from coastal areas, 58.43 per cent in those from the mountains and 75 per cent in those in the wooded regions. The figures of positivity to tuberculin in Peru are higher than those in Argentina, Brazil, Paraguay and Uruguay and lower than those in Cuba and Venezuela. Dr. Leopoldo Molinari recently reported the results of roentgen examinations carried on in school children. Tuberculosis in evolution increased from 4.1 per cent in 1939 to 5.3 per cent in 1941. Secondary and tertiary forms also increased in the years 1940 and 1941.

A new tax law was passed in Peru by which all articles, especially cosmetics, will be sold with an antituberculosis stamp. The government will use the money for the construction and care of antituberculosis centers.

Endocrinologic Work in Montevideo

The Institute of Endocrinology of Montevideo was established in 1937. Dr. J. C. Mussio Fournier, professor of endocrinology of the Faculty of Medicine of Montevideo and minister of public health of Uruguay, is the director. The institute is a center for research on endocrinology, the prevention and therapy of endocrinologic diseases and for postgraduate teaching. The largest number of patients are those with endocrinologic diseases. The institute also has wards for gynecologic, neurologic, cardiovascular and otorhinolaryngologic diseases, and visiting nurses who regularly visit the schools for children to collaborate with the physicians of the schools for the diagnosis and therapy of endocrine disorders. About 2,000 school children are now under the medical care in the institute. The treatment of the patients is directed in the institute and carried on at home under supervision of the visiting nurses.

Personals

Prof. Dr. Mamerto Acuña, professor of pediatrics and puericulture of the Faculty of Medicine of Buenos Aires and director of the Instituto de Pediatría, retired from the faculty, having reached the age limit.——Dr. R. M. Taylor of the Rockefeller Foundation and the head of the virus department of the National Department of Hygiene recently lectured at the Academia Nacional de Medicina of Buenos Aires on influenza.——Dr. Abelardo Sáenz of Montevideo, Uruguay, recently returned from Paris, where for fifteen years he was head of the department of laboratory research on tuberculosis of the Pasteur Institute. He published several articles on tuberculous bacillemia, exogenic reinfection and tuberculous allergy. Dr. Sáenz won the Pasteur prize, a silver medal, in 1939, when the institute celebrated its fiftieth anniversary. The prize was given because of his scientific contributions and devotion to bacteriology in the institute. The minister of war of France gave Dr. Sáenz the important commission of being in charge of the sanitary condition of the Franco-Spanish border. Dr. Sáenz was awarded the Boggio prize and a medal by the Academy of Medicine of Paris and the Henriette Reghier prize by the Academy of Sciences.——Dr. Gerardo Laguardia, dean and professor of the Faculty of Medicine, recently died in Asunción, Paraguay.

Marriages

ALFRED LEON HOLLOMAN, Assistant Surgeon, U. S. Public Health Service, to Miss Helen Fulmer at Savannah, Ga., May 30.

CHARLES W. GEIGER to Mrs. Viola Karnstrom, both of Kankakee, Ill., in Bowling Green, Mo., June 29.

FREDERICK COOPER REHFELDT, Jackson, Miss., to Miss Ethel Evans Bennett in Fort Worth, Texas, recently.

WARREN MATAS KIRK, Louisville, Miss., to Miss Dorothy Kindelberger of Wheeling, W. Va., June 20.

JOSEPH ALLISON CANNON WADSWORTH to Miss Martha T. Buchanan, both of Durham, N. C., recently.

JOHN GILMER MEBANE, Boston, to Miss Harriet de Berniere Elmore in Rutherfordton, N. C., in June.

ERNEST RANDALL BARNETT, Terre Haute, Ind., to Miss Mildred Ewing of Olathe, Kan., May 21.

WILLIAM VILARDO, Garfield, N. J., to Miss Helen Frances Beers of Ticonderoga, N. Y., January 3.

GEORGE ROBERT DAWSON JR., Charleston, S. C., to Miss Ada Frances Gilchrist of Rock Hill in June.

ROBERT SYDNEY PRESSMAN, Philadelphia, to Miss Reba Anna Melvin at South Mills, N. C., June 2.

KYLE E. BLACK to Miss Helen Elizabeth Apps, both of New York, in Attleboro, Mass., in June.

EMMETT SMYER BRANNON to Miss Anna Margaret Bond, both of Atlanta, Ga., July 4.

JOHN D. LECKY, Calvert City, Ky., to Miss Sara Watts Nickols of Glasgow, July 6.

ROBERT MORRIS to Miss Eileen Myers, both of Johannesburg, South Africa, May 5.

BRANHAM B. BAUGHMAN to Miss Matilda F. Hoge, both of Frankfort, Ky., July 18.

HUBERT R. OWEN, Atlanta, Ga., to Miss Esther Jane Corley of Boaz, Ala., recently.

Deaths

Carey Culbertson ● Winnetka, Ill.; Northwestern University Medical School, Chicago, 1898; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member of the American Gynecological Society and Chicago Pathological Society; a founder and member of the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; for many years clinical professor of obstetrics and gynecology at the Rush Medical College, Chicago, and in 1941, when the school was taken over by the University of Illinois College of Medicine, became professor of obstetrics and gynecology emeritus; served as a major in the medical corps of the U. S. Army during World War I; formerly member of the board of health of Chicago and medical inspector of the public schools; chief of the staff of gynecology at the Cook County Hospital, Chicago, from 1925 to 1937 and for many years attending gynecologist; attending obstetrician and gynecologist to the Presbyterian Hospital, Chicago, from 1908 to 1938; formerly consulting obstetrician to the Norwegian American Hospital, Chicago; member of the Chicago Historical Society, Institute of American Genealogy and the Oriental Institute of the University of Chicago; at one time abstract editor of *Surgery, Gynecology and Obstetrics*, editor of Gregorio Marañón's book "The Climacteric" and author of "Surgery of the Female Pelvis"; aged 71; died, October 9, in the Veterans Administration Facility, Downey, of pneumonia.

Arthur Douglass Hirschfelder ● Minneapolis; Johns Hopkins University School of Medicine, Baltimore, 1903; professor of pharmacology at the University of Minnesota Medical School and professor of pharmacology and therapeutics at the University of Minnesota Graduate School; assistant in medicine at the Cooper Medical College, San Francisco, 1904-1905; formerly voluntary assistant, instructor and associate in medicine at his alma mater; associate fellow of the American Medical Association, chairman of the Section on Pharmacology and Therapeutics, 1917-1918, and member of the House of Delegates in 1919; member of the American Society for Clinical Investigation, the Society of Experimental Biology and Medicine, the American Society of Pharmacology and Experimental Therapeutics, the American Physiological Society, the American Society of Biological Chemists, the American Chemical Society and the Minnesota Academy of Science; pharmacologist in the war department in 1918; author of "Diseases of the Heart and Aorta" and co-author of "An Investigation of the Louse Problem"; aged 63; died, October 11, of coronary sclerosis.

James Torrance Rugh ● Philadelphia; Jefferson Medical College of Philadelphia, 1892; for many years professor of orthopedic surgery at his alma mater and since 1938 emeritus professor; member of the American Orthopaedic Association and the American Academy of Orthopaedic Surgeons; during World War I was commissioned a captain in the reserve corps of the Army and served as orthopedic surgeon to the Jefferson Unit number 38; was supervising orthopedic surgeon in camps in North Carolina, South Carolina and Georgia and after being commissioned a major was assigned to duty in the division of orthopedic surgery, Surgeon General's Office, became a lieutenant colonel; formerly on the staffs of the Jefferson, Methodist and Philadelphia General hospitals; in 1934 the senior class of the Jefferson Medical College presented his portrait to the college; received the degree of doctor of laws from Gettysburg College in 1930; aged 75; died, October 12, at his home in Bala-Cynwyd, Pa.

Curtis Clyde Eves ● Philadelphia; Medico-Chirurgical College of Philadelphia, 1905; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology, the American Laryngological Association, the American Laryngological, Rhinological and Otological Society, the American Otological Society, Inc., and the American Broncho-Esophagological Association; served during World War I; a member of the board of managers of the George School; formerly on the staff of the Hospital of the Protestant Episcopal Church; on the consultant staff of the Philadelphia General Hospital; on the consultant staff and at one time head of the ear, nose and throat service at the Bryn Mawr (Pa.) Hospital and the Pennsylvania Hospital, where he died, September 22, aged 66.

Joseph Pilmoor Gilbert ● Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1923; member of the American Psychiatric Association; formerly secretary and vice president of the Nashville Academy of Medicine; served overseas during World War I; consultant psychiatrist for the Madison Rural Sanitarium and Hospital, Madison College, and the Central State Hospital; on the general staffs of the Protestant Hospital and St. Thomas Hospital; on the nursing school faculties of the latter hospital and the Nashville General Hospital; aged 48; died, September 3, of heart disease.

Jesse Philip Van Keuren ● Chester, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1905; formerly served as civil service commissioner; past president of the Delaware County board of prison inspectors; for many years chief of the surgical staff of the J. Lewis Crozer Homeopathic Hospital, Chester; on the staffs of the Children's Hospital and St. Luke's Hospital, Philadelphia; aged 59; died, September 10, in the Hahnemann Hospital, Philadelphia, of staphylococcic septicemia, fracture of the left hip and multiple abscesses.

Julius Fernan Wenn, Milwaukee; Rush Medical College, Chicago, 1902; member of the State Medical Society of Wisconsin, American Psychiatric Association and the Central Neuropsychiatric Association; served as a captain during World War I; formerly medical director of St. Mary's Hill; at one time on the staff of the Kankakee (Ill.) State Hospital; formerly state inspector of private sanatoriums in Illinois; aged 64; died, September 4, in the Sacred Heart Sanitarium of hypertensive cardiovascular disease.

Regina Flood Keyes Roberts, Chefoo, China; University of Buffalo School of Medicine, 1896; formerly clinical instructor in obstetrics at her alma mater; at one time on the staffs of the Buffalo General and Erie County hospitals, Buffalo; organized and was head of a base hospital in Salonika, Greece, during World War I; was decorated by the French, Serbian and Belgian governments; aged 72; died, July 10, while aboard the S. S. *Conte Verde* of a ruptured gallbladder.

John Thomas Floyd, Atlanta, Ga.; Atlanta College of Physicians and Surgeons, 1905; member of the Medical Association of Georgia; at one time assistant to the chair of obstetrics at the Atlanta School of Medicine; served on the local draft board and as a captain in the medical corps of the U. S. Army during World War I; on the staffs of the Georgia Baptist, Crawford W. Long and Grady hospitals; aged 61; died, September 7, of coronary thrombosis.

Lewis Booker ● New Castle, Del.; University of Virginia Department of Medicine, Charlottesville, 1910; past president of the New Castle County Medical Society; served during World War I; medical examiner for the county Selective Service System; aged 55; member of the state board of trustees of the Delaware State Hospital, Farnhurst; on the staff of the Delaware Hospital, Wilmington, where he died, September 27, of acute coronary thrombosis.

James Dwight Matthews, Detroit; Detroit College of Medicine, 1892; fellow of the American College of Surgeons; served during World War I; formerly lecturer in anatomy at his alma mater; on the surgical staffs of the Providence, Woman's and Detroit Eye, Ear, Nose and Throat hospitals and the Detroit Tuberculosis Sanatorium; aged 74; died, September 2, in the Veterans Administration Facility, Dearborn, of pernicious anemia.

Edward Geddus Minor ● Detroit; Detroit College of Medicine, 1912; member of the Radiological Society of North America, Inc., and the American College of Radiology; specialist certified by the American Board of Radiology, Inc.; aged 54; director of the x-ray department of the Highland Park (Mich.) General Hospital, where he died, September 9, of hypertensive heart disease and myocardial infarction.

Walter Louis Migely, Naperville, Ill.; Northwestern University Medical School, Chicago, 1910; member of the Illinois State Medical Society; president of the board of health of Naperville; past president of the Du Page County Medical Society and the Du Page County Tuberculosis Association; aged 58; died, September 13, in the Copley Hospital, Aurora, of cerebral hemorrhage and hypertension.

Robert Joseph Haley Sr., Paragould, Ark.; Memphis (Tenn.) Hospital Medical College, 1899; member of the Arkansas Medical Society; past president of the Greene County Medical Society; formerly bank president and president of the city board of health; president of the Dickinson Memorial Sanitarium from 1927 to 1940; aged 74; died, September 14, of coronary thrombosis.

Lewis C. Wessels, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1892; founder of the division of ophthalmology in the city department of public health in 1907 and in 1893 medical inspector in the division of communicable diseases; on the staffs of the Woman's Homeopathic and Hahnemann hospitals; aged 81; died, September 4, of coronary occlusion.

William Henry Clewell, Coaldale, Pa.; Medico-Chirurgical College of Philadelphia, 1896; veteran of the Spanish-American War; formerly president of the board of health of Coaldale, medical examiner for the district schools and a member of the county Selective Service System; aged 72; died, September 10, in the Palmerton (Pa.) Hospital of carcinoma of the pancreas.

Lattie Graves ● Scottsville, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1915; served for many years on the city school board; member of the Southeastern Surgical Congress; president of the Allen County Medical Society; aged 61; medical superintendent of the Graves Infirmary, where he died, September 20, of coronary thrombosis.

Charles Hope Jaeger, New York; Columbia University College of Physicians and Surgeons, New York, 1896; specialist certified by the American Board of Orthopaedic Surgery, Inc.; member of the American Orthopaedic Association; consulting orthopedic surgeon on the staff of the Lenox Hill Hospital; aged 66; died, September 12, of cerebral hemorrhage.

William P. Grady ● Montclair, N. J.; Long Island College Hospital, Brooklyn, 1908; member of a medical examining board during World War I; attending physician at Mount St. Dominic's Academy and College, Caldwell; aged 59; on the staff of St. Mary's Hospital, Orange, where he died, September 28, following an operation for appendicitis.

Morris L. Simon ● Passaic, N. J.; Columbia University College of Physicians and Surgeons, New York, 1912; served as a first lieutenant in the medical corps of the U. S. Army during World War I; formerly health officer of East Paterson; on the staff of the Beth Israel Hospital; aged 52; died, September 1, of perforated gastric ulcer.

Charles Henry Rannells Jr., Evanston, Ill.; State University of Iowa College of Medicine, Iowa City, 1936; member of the Illinois State Medical Society; was called to active duty as a first lieutenant in the medical reserve corps of the U. S. Army March 7, 1941 and retired May 30, 1942; aged 29; died, August 23, of bronchial asthma.

Adam Blasius Wolf, Brooklyn; Eclectic Medical College of the City of New York, 1907; examiner for a local draft board during World War I; aged 77; died, September 17, in the Bethany Deaconess Hospital of prepatellar bursitis, arteriosclerosis and acute dilatation of the heart.

Charles Magnus Pearson, Tacoma, Wash.; Rush Medical College, Chicago, 1904; member of the Washington State Medical Association; served in the medical corps of the U. S. Army during World War I; aged 69; died, September 11, of coronary thrombosis.

Bernard Albert Becker, Silverlake, Wis.; Marion-Sims College of Medicine, St. Louis, 1898; member of the State Medical Society of Wisconsin; aged 72; was killed, September 14, when the automobile in which he was driving was struck by a train.

John William Moore, Dialville, Texas; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1893; member of the State Medical Association of Texas; aged 71; died, September 14, of uremia and a fractured hip received in a fall.

Amos De Russia Wood, Bluefield, W. Va.; College of Physicians and Surgeons, Baltimore, 1893; member of the West Virginia State Medical Association; aged 73; died, September 14, at the Bluefield Sanitarium of carcinoma of the stomach.

Thomas Francis Manning, Rock Island, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; aged 67; died, September 7, in the Mercy Hospital, Davenport, Iowa, of abdominal carcinoma.

Charles Joseph Walsh, Gilbertville, Mass.; College of Physicians and Surgeons, Baltimore, 1892; member of the Massachusetts Medical Society; aged 83; died, September 6, in the Mary Lane Hospital, Ware, of cardiorenal disease.

Charles Henry Duncan, New York; New York Homeopathic Medical College and Hospital, New York, 1905; aged 76; died, September 27, in the New York Polyclinic Medical School and Hospital of a self-inflicted bullet wound.

Louis Spitz ● Philadelphia; Jefferson Medical College of Philadelphia, 1902; an Affiliate Fellow of the American Medical Association; aged 68; died, September 7, in the Mount Sinai Hospital of coronary occlusion and arteriosclerosis.

Orvis L. William Hall, Boise, Idaho; University of Vermont College of Medicine, Burlington, 1883; member of the Idaho State Medical Association; aged 80; died, September 9, in Nampa of cerebral hemorrhage.

Joseph Melnick ● Brooklyn; Long Island College Hospital, Brooklyn, 1925; aged 41; clinical assistant in pediatrics on the staff of the Jewish Hospital, where he died, September 9, of lymphosarcoma of the colon.

Clarence Trimble Ricketts ● Manchester, Ky.; Kentucky School of Medicine, Louisville, 1906; mayor of the city of Manchester; aged 67; died, August 19, of coronary thrombosis and pulmonary embolism.

Aubrey Leighton Loop ● Crawfordsville, Ind.; Medical College of Indiana, Indianapolis, 1899; served during World War I; at one time county coroner; aged 67; died, September 5, of heart disease.

Joseph Hill Winfrey, Glenallen, Va.; University College of Medicine, Richmond, 1899; member of the Medical Society of Virginia; aged 70; died, September 7, in Richmond of coronary thrombosis.

Moses Nathan Avery, Los Angeles; University of Michigan Homeopathic Medical School, Ann Arbor, 1881; formerly bank president; aged 97; died, September 9, of coronary occlusion.

Francis Henry Schlink, Cleveland Heights, Ohio; Miami Medical College, Cincinnati, 1880; aged 86; died, September 16, in the Polyclinic Hospital, Cleveland, of uremia and nephritis.

Eugene Joseph Kenny, Brooklyn; Long Island College Hospital, Brooklyn, 1889; aged 73; died, September 6, in the Hospital of the Holy Family of arteriosclerotic heart disease.

Andrew J. Dodds, Pittsburg, Kan.; Medical College of Ohio, Cincinnati, 1885; member of the Kansas Medical Society; aged 84; died, September 18, of chronic valvular heart disease.

Charles Heinz Bishop ● Wichita Falls, Texas; Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main, Prussia, Germany, 1935; aged 36; died, August 18.

Leo Ricen ● Portland, Ore.; University of Oregon Medical School, Portland, 1901; formerly on the staff of the Emanuel Hospital; aged 70; died, September 8, of coronary thrombosis.

Richard P. Haas, Williamstown, Pa.; Jefferson Medical College of Philadelphia, 1881; aged 85; died, September 19, of cerebral hemorrhage and chronic myocarditis.

William Harper, Jersey City, N. J.; Long Island College Hospital, Brooklyn, 1909; also a clergyman; formerly a medical missionary; aged 57; died, August 5.

Lawrence W. Dolan, Erie, Pa.; Medico-Chirurgical College of Philadelphia, 1911; aged 56; died, September 14, in St. Vincent's Hospital of heart disease.

Leon Edgar Norfleet, Tarboro, N. C.; College of Physicians and Surgeons, New York, 1888; aged 78; died, September 12, of cerebral hemorrhage.

Cloyd L. Souder, Safety Harbor, Fla.; Medical College of Ohio, Cincinnati, 1880; aged 89; died, August 30, of coronary occlusion and arteriosclerosis.

Posey G. Hurst, Oceana, W. Va.; Kentucky School of Medicine, Louisville, 1905; aged 63; died, September 14, of myocarditis and a fractured hip.

Frederick A. Clapsadel, Hessel, Mich.; Cleveland University of Medicine and Surgery, 1897; aged 75; died, August 23, of cerebral hemorrhage.

Byron Noble Gantz, Fairfield, Iowa; Hahnemann Medical College and Hospital, Chicago, 1885; aged 81; died, August 16, of chronic myocarditis.

Thomas Webster Edgar, New York; University and Bellevue Hospital Medical College, New York, 1913; aged 52; died, August 8.

Alonzo Teegarden Holt, Los Angeles; Kansas City (Mo.) Medical College, 1875; aged 88; died, August 22, of chronic myocarditis.

Henri Lacourciere, Beauport, Que., Canada; School of Medicine and Surgery of Montreal, 1883; aged 88; died, August 16.

Howard Greene Barrie, Paris, Ont., Canada; Trinity Medical College, Toronto, 1899; aged 68; died, August 19.

James B. Quinn, Quincy, Mass.; Maryland Medical College, Baltimore, 1913; aged 51; died, August 7.

DIED WHILE IN MILITARY SERVICE

Josiah Dozier Bancroft ● Birmingham, Ala.; Tulane University of Louisiana School of Medicine, New Orleans, 1931; was commissioned a captain in the medical corps of the U. S. Army and on May 13, 1942 was assigned to active duty at Camp Rucker, where he died, September 1, of coronary embolism, aged 39.

Bureau of Investigation

CEASE AND DESIST ORDERS

Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the medical as well as other fields, has been greatly extended by the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act. The Food, Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the labels of medicine or on the carton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in circulars, newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission by virtue of the Wheeler-Lea Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection, even before the Wheeler-Lea Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual, manufacturer or distributor cited is ordered to cease and desist from practices which have been declared objectionable. In some cases the claims cited have been discontinued by the firms several months (or even longer) before the issuance of the order. Abstracts of some of the orders issued in 1942 follow:

Alcoban.—The promoters of this must no longer represent that it constitutes a competent or safe treatment for alcoholism, or issue any advertisements which fail to reveal that the use of the product may produce toxic conditions in the body and result in serious injury to the nerves, heart and lungs. This prohibition, the outgrowth of a complaint initiated in March 1939, was issued in March 1942 by the Federal Trade Commission in an order brought against Western Chemicals, Inc., Maffett Sales Corporation, Bartell Drug Company, Frank L. Wilson, N. B. Wilson and Reuel K. Yount, all of Seattle. In THE JOURNAL, Jan. 10, 1942, page 163, there appeared brief mention of a case in which the Commission, in January 1941, had ordered an Edwin L. Leisenring, trading as U. S. Drug & Sales Company, U. S. Drug Laboratories and U. S. Drug Company, and Gordon Leisenring, both of Denver, to cease representing that a product they were selling as "Alcoban" was a safe and competent treatment for alcoholism and to discontinue any advertisements which failed to reveal that the use of their nostrum might result in serious injury to the nerves, tissues and lungs and might produce toxic conditions in the body. No connection between the Denver and Seattle concerns, however, is evident, although each sells an "Alcoban."

BonKora.—In July 1941 the Federal Trade Commission issued a complaint against the advertising claims for this product, promoted by Battle Creek Drugs, Inc., Battle Creek, Mich., and Consolidated Royal Chemical Corporation, Chicago, trading as Consolidated Drug Trade Products and as BonKora Company. In February 1942 these concerns were ordered by the Commission to discontinue the following misrepresentations: that BonKora is a popular cocktail preparation; that if taken as directed it will relieve or overcome obesity or reduce excess fat without dieting; that it will reduce fat from designated parts of the body and that it contains no dangerous drugs and may be taken repeatedly with safety. Also ordered discontinued were any advertisements which failed to reveal that the product should not be used by persons suffering from nausea, vomiting, abdominal pains or other symptoms of appendicitis, provided, however, that the advertising might limit its warning to the statement, "Caution, use only as directed," when the labeling of the product made clear the potential dangers in using the preparation. According to the order BonKora is a saline cathartic containing epsom salt supplemented by the laxative action of buckthorn and cascara bark, and its continued use may be habit forming in causing the user to become dependent on a laxative for the evacuation of the bowels.

Charles of the Ritz Rejuvenescence Cream.—In October 1939 the Federal Trade Commission issued a complaint against the Charles of the Ritz Distributors Corporation, New York, charging that the use of the word "Rejuvenescence" falsely represented that this product would rejuvenate the skin or restore youth or the appearance of youth to the skin of the user. In May 1942 the Commission ordered the concern to discontinue these misrepresentations.

Chumasio Products.—As the follow-up of a complaint issued in July 1941 by the Federal Trade Commission, an order to cease and desist from misrepresenting the therapeutic properties of these nostrums was issued by the Commission in May 1942 against Charles Roehm, trading as Chumanie Medicine Company, New Richmond, Ohio. Among other misrepresentations cited were: that "Chumanie's Iron Tonic Pills" are an effective treatment for anemia, except in those cases of anemia that result from a deficiency of iron in the diet, or that the symptoms of feeling "played out" or of nervousness indicate a deficiency of iron in the diet; that "Chumanie's Yellow Jacket Pills" provide a stimulant to the kidneys, except as a mild diuretic or an effective treatment for kidney or bladder disorders, or for such symptoms as backache, leg pains or swollen eyes; that "Chumanie's Double RR Tablets" constitute an effective treatment for rheumatism or inflamed painful joints or will have any therapeutic effect in the treatment of such conditions beyond mitigating the distress and discomforts thereof; that "Chumanie's Plantation C. M. Q. Capsules" are a treatment for the relief of the common cold, and that "Chumanie's Triple XXX Tablets" constitute a safe or competent treatment for irregular or delayed menstruation. The promoters further were ordered to discontinue any advertisement which failed to reveal that use of this product may cause gastrointestinal disturbances, pelvic congestion, excessive uterine hemorrhages and, in cases of pregnancy, infection of the pelvic organs and blood poisoning.

Freeman's Pyloffs.—In October 1941 the Federal Trade Commission issued a complaint against Merritt Freeman Butler, trading as Freeman's Products, Howard City, Mich. (formerly of Grand Rapids, Mich.), who promoted this product. In April 1942 the Commission ordered Butler to cease advertising that this product is a cure, remedy or effective treatment for hemorrhoids, will ease pain quickly or offer any value in promoting good health in excess of its laxative properties. The order also directed him to discontinue any advertisement which failed to reveal that this nostrum should not be used by persons suffering from nausea, vomiting, abdominal pains or other symptoms of appendicitis and that continued use might result in phosphorus poisoning and consequent deterioration of the bones. Butler was, however, permitted to limit this warning in advertisements to the statement: "Caution, use only as directed" provided that the labeling of the product would bear adequate warning of the potential danger in using the preparation.

Loughneys (Dr. A. M.) Dependable Guide to Self-Help, Anti-Spasthma-Oyl and Bowelkleen.—In July 1941 the Federal Trade Commission issued a complaint against the promoters of these products, who were Al Modey Loughney and Roger G. Loughney, trading as Dr. A. M. Loughney, Oakland, Calif. In April 1942 the Commission ordered these persons to discontinue advertisements which contained any of the following misrepresentations: that the Loughneys' program of treatment or their medicinal preparations, whether used separately, jointly or in combination with the program set out in their literature, constitute a cure or remedy or safe treatment for asthma, hay fever, neuritis, rheumatism, bronchitis, stomach and bowel disorders, high blood pressure or diabetes; that Anti-Spasthma-Oyl, whether used alone or in any combination with Bowelkleen and the recommended program, is a cure or remedy or safe treatment for pharyngitis, laryngitis, chest or head colds or pneumonia or possesses sedative, healing or disinfectant properties; that Bowelkleen, whether used alone or with Anti-Spasthma-Oyl and the program mentioned, is a cure or remedy for constipation or intestinal putrescence other than the temporary evacuation of the bowels; that it is of any value whatever in the treatment of catarrh, acne, mucus colitis or kindred ailments or is a safe treatment for nausea or upset stomach; that the existence of such symptoms as sour breath, coated tongue, indigestion, nausea, lack of energy, headaches or loss of appetite usually indicates that constipation or intestinal putrescence is the basic cause of such conditions. The Loughneys further were ordered to discontinue any advertisements of Anti-Spasthma-Oyl which failed to reveal that its frequent use may cause oil pneumonia or those of Bowelkleen which did not disclose that this nostrum should not be used by persons suffering from abdominal pains or other symptoms of appendicitis, with the provision, however, that these warnings are carefully stated on the labels of the product the advertisements need contain only the statement, "Caution, use only as directed." The order further directed them to discontinue any advertisements of their "program" which failed to reveal that it should not be followed by persons suffering from undernourishment or diabetes.

Herolin Preparations.—In December 1940 the Federal Trade Commission issued a complaint against the Herolin Company, Inc., of Atlanta, Ga., and its president, Bert H. Rubin, who promoted these products. In March 1942 Rubin and his concern were ordered by the Commission to discontinue making the following misrepresentations in their advertising: that "Original Herolin Beautiful Hair Dressing" penetrates to the roots of the hair, revives hair cells or makes hair grow or prevents dandruff or other scalp ailments and also to cease misrepresenting the alleged efficacy of their preparations "Herolin Hair Gloss and Temple Oil," "Herolin Nayco Tablets" and "Herolin Female Tonic." The concern also was to cease implying that the therapeutic effects of "Herolin Moonbeam Pills," "Herolin Moonbeam Tonic" and "Herolin Cream Salve" are in excess of certain temporary relief that they may afford and that "Herolin Tetter Salve" has any value in the treatment of dandruff beyond that of softening dandruff scales and facilitating their removal. The Commission further ordered the concern to cease advertising that "Herolin Blood Tonic" will build blood or offer any value in treating skin or blood disorders and that "Herolin Healing Oil" is capable of penetrating the skin to the muscles or joints or constitutes an effective treatment for rheumatism, lumbago and other ailments and to discontinue advertisments which used the words "Blood Tonic" as part of the name "Herolin Blood Tonic" and otherwise represented that it was such a tonic, or used the word "Healing" as part of the name "Herolin Healing Oil." The company further was ordered to include in its advertisements the warning that the use of the "Blood Tonic" may result in chronic mercury poisoning and should not be used by persons having tuberculosis or goiter, and to warn users of "Herolin Healing Oil" against repeated application because of possible consequences.

Magnesia & Pellegrina.—In October 1941 the Federal Trade Commission issued a complaint against the Codrin Corporation of New York, which puts this out. In May 1942 the Commission ordered the Codrin concern to cease representing that this preparation will assure perfect digestion or health, will not irritate the intestines, is a disinfectant and a competent treatment for constipation or stomach acidity

or any disease, in excess of temporarily relieving constipation and reducing stomach acidity. The order further directed this concern to discontinue any advertisements which failed to reveal that the product should not be used in cases of abdominal pains, stomach ache, cramps, nausea, vomiting or other symptoms of appendicitis or that its frequent or continued use might result in dependence on laxatives. The concern, however, was permitted to limit this warning in advertisements to the statement "Caution: use only as directed" provided that the labeling of the product contained an appropriate warning of the potential danger in the use of the preparation.

McK. Edwards Eczema Remedy.—In September 1940 the Federal Trade Commission issued a complaint against a person known as McK. Edwards of Valley, Wash., who put out this product. In February 1942 the Commission ordered Edwards to cease representing that his nostrum, except in cases of fungus infection, is a cure or remedy for or has any value in the treatment of eczema, beyond giving relief in some cases from the symptom of itching; that it is of value in treating ivy or oak poisoning or, in these cases, will do anything more than afford temporary relief. The order further prohibited Edwards from disseminating any advertisements which failed to reveal that the use of his preparation might in some cases produce an excoriating effect or an acute or painful rash on the skin, or, if employed on certain types of eczema, might seriously aggravate the eczematous condition. He was permitted, however, to limit this warning in advertisements to "Caution, use only as directed" when the labels of the product contained appropriate warnings. The Commission further reported that this product is a solution of salicylic acid, alcohol and water, with a minute amount of ethyl acetate, and pointed out that salicylic acid is frequently used in preparations intended for treating skin disorders, but customarily in much smaller proportion than that present in the Edwards product.

M. D. Medicated Douche Powder.—As the result of a complaint that the Federal Trade Commission issued in May 1940, that agency, in April 1942 ordered Stanley Laboratories, Inc., Portland, Ore., and its president, Edward A. Bachman, to discontinue the following false advertising representations in the sale of this preparation: that it is a "dependable safeguard" and an "effective reliable antiseptic powder," thus implying that it is a contraceptive or prophylactic; that it is a recent development of scientific research and is endorsed by physicians and surgeons; that it will have any effect on bacteria in excess of its action as a mild antiseptic or offer any substantial value in the treatment of cuts, sores or burns. The order further prohibited the use of the letters "M.D." in the name of this product, use of the picturization of a cross or any other simulation of the American Red Cross emblem alone or with the picture of a doctor or a nurse or employment of the word "Laboratories" in their corporate or trade name or in any manner representing that they own or operate a laboratory equipped for compounding medicinal preparations and for research in connection therewith.

Pink Ointment.—In November 1941 the Federal Trade Commission issued a complaint against John B. Armstrong, M.D., Topeka, Kan., trading as Pink Ointment Company, who promoted this as a cure or remedy for eczema, poison ivy, ringworm, cuts, burns, bruises, athlete's foot and all kinds of skin irritations. In February 1942 the Commission ordered Armstrong to discontinue these misrepresentations and to limit the claims for its value to its antiseptic effect and to the results it afforded in giving temporary local relief due to its counterirritant, antipruritic and analgesic properties. The Commission found that the product in question contained carbolic acid in sufficient quantities to be dangerous to the user's health. Accordingly the order further prohibited any advertisement which failed to reveal that the use of Pink Ointment may cause necrosis of the skin and tissues and systemic poisoning, including irritation of the kidneys, and that the danger of such injury will be increased if the skin surface to which it is applied is inflamed or broken. This order, however, permitted Armstrong to limit his warning in advertisements to the statement, "Caution, use only as directed," when the labeling of the product contained appropriate warnings.

Queen Ann Hair Dye.—In December 1941 the Federal Trade Commission issued a complaint against Clifford S. Donnell, trading as Queen Ann Manufacturing Company, Newark, N. J., who put out this dye, which also was known as "Queen Ann Hair Coloring" and "Queen Ann Liquid Hair Coloring." In February 1942 the Commission ordered Donnell to discontinue any advertisements which represented that this product was an amazing new hair dye which would preserve the natural beauty of the hair, make it smooth or silky, would stop it from growing gray or give gray hair a permanent coloring; that it can be applied in half the time required to apply other hair dyes, is quicker drying or causes the hair to hold its color longer than all other dyes; that it is used exclusively by better beauty shops or is endorsed by the State Beauty Commission of New Jersey. The order also provided for discontinuance of any advertisements which contained the word "manufacturing" as part of the trade name or which otherwise represented that Donnell owns or operates a manufacturing plant or makes this product himself. The Commission's findings were that the dye in question is not "an amazing or a new one," as advertised, but is a coal tar preparation similar to many other hair dyes. Eight months earlier (June 1941) Donnell's concern was one of a number of dealers in hair dyes which had stipulated with the Federal Trade Commission that they would publish proper cautionary statements in connection with the sale of their dyes.

Ronni Mascara.—In August 1941 the Federal Trade Commission issued a complaint against a New York firm known as Parfums Ronni, Inc., which put out this cosmetic, also called "Ronni Cream Mascara" and "Mascara by Ronni." In March 1942 the Commission ordered this concern to discontinue any advertisement which represented that the product in question is "smudge proof," "waterproof," "runproof" or "tearproof" by use of any of the terms stated or other words or terms of similar meaning.

Sebrone and Waft.—In August 1940 the Federal Trade Commission issued a complaint against the Sebrone Company, Chicago, formerly known as Sebroeen Laboratories, Inc. In May 1942 the Commission ordered the Sebrone Company and its officers and directors, as well as the Federal Cosmetic Sales Corporation, Springfield, Ill., which has sold the Sebrone product, and one of its officers, to cease representing that Sebrone is a cure or remedy for dandruff or has any value in treating that condition in excess of assisting in the temporary removal of dandruff scales and beneficially affecting superficial infections of the scalp sometimes associated with dandruff; that the use of Sebrone will have any helpful effect on scars or remove scar tissue or possesses any value in treating conditions which cause baldness or that it will prevent baldness. The order further directed the promoters to cease representing, through use of the terms "stops dandruff" and "ends dandruff," that Sebrone will permanently eliminate dandruff or that it constitutes a cure or remedy for the underlying conditions which may cause dandruff. Also, the order prohibited the misrepresentations that the other product, Waft, will destroy or mitigate unpleasant body and foot odors except by temporarily masking them; that it possesses value in treating any disease or condition causing excessive sweating, will reduce excessive sweating to normal or have any effect on this condition other than the temporary one afforded by the use of an astringent. Finally the order prohibited the misrepresentation that Sebrone and Waft are new discoveries or recent developments of scientific research.

Sore.—The Federal Trade Commission issued a complaint in November 1939 against one Fannie P. Fox, trading as Sore Laboratories, Chicago, who put out this product. In January 1942 the Commission ordered her to discontinue the following misrepresentations in her advertising: that her preparation is a neutralizing agent, a breath purifier, will destroy or arrest the causes of unpleasant breath or have any effect on that condition other than that of a perfume in temporarily masking such odors.

Vita Ray.—In August 1940 the Federal Trade Commission issued a complaint against Sterling Products, 170 Varick St., New York, and the Vita-Ray Corporation of Lowell, Mass. Subsequently, in May 1942, the Commission issued an order against these concerns, reporting that its findings were to the effect that the promoters' cosmetic cream has no beneficial or therapeutic effect because of the addition of vitamins A and D; that there is no scientific basis for the claim that there is any local, direct or selective action at the site of application or that there is any local or systemic effect whatever. The respondents were also ordered to cease disseminating advertisements which represent that their cosmetic creams and oils have any added beneficial value on the skin by reason of their vitamin content.

Warner's Restroms.—These are put out by Warner's Renowned Remedies Company, Minneapolis, and include "Warner's Renowned Prescription No. 6," "Warner's Renowned Laxative Tablets" and "Warner's Renowned Alkaline Douche Tablets," which are sold separately and in combination under the designation "Prescription No. 6 Complete," "Prescription No. 6 Method" and "Formula No. 6 Method." As the follow-up of a complaint issued in May 1940 by the Federal Trade Commission, that agency in March 1942 ordered the Warner concern to cease representing that its preparations, either singly or in combination, are cures, remedies or effective treatments for functional sterility; have therapeutic value in treating any form of sterility, or possess any properties which have value in promoting the functioning of the female reproductive organs.

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Cosmetics

The following items are abstracts of stipulations in which promoters of cosmetics have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Priscilla Parker Breath Correcting Lipstick.—This is put out by R. W. Appleton, trading as Parker-Bouldin Company, St. Paul. In March 1942 he signed a stipulation with the Federal Trade Commission in which he agreed to cease representing that this product is effective in neutralizing offensive breath and that its ingredients are harmless. Further, he agreed to discontinue any advertisements which failed to reveal that continued use of the lipstick over too prolonged periods of time might cause exfoliation of the skin; provided, however, that such advertisements need contain only the statement, "Caution, use only as directed," if the label contains an appropriate warning. According to the stipulation this lipstick contains a chemical, resorcin. Appleton further agreed to cease using the terms "Breath Correcting" or "Deodorizing" in the brand name of this product.

Zenaida.—That this will banish gray hair or restore the original color of the hair and will not stain the clothing, hands or scalp, were misrepresentations which Eladio Santini and Sylvia Pietri, trading as Dr. H. A. Pietri Company, New York, agreed to discontinue, in a stipulation that they signed with the Federal Trade Commission in July 1941. They also agreed to drop the use of the prefix "Dr." in their trade name and to cease representing that Zenaida is made or offered for sale by a Doctor of Medicine.

Correspondence

"CONVULSIONS AND DEATH, PROBABLY FROM COCAINE"

To the Editor:—I read with interest the query by M.D., U. S. Navy, "Convulsions and Death, Probably from Cocaine," in THE JOURNAL, September 12, page 166.

I think it might be a good idea for the inquirer to find out how the cocaine solution had been prepared and whether it was sterilized in an autoclave or if it had been exposed to high heat for considerable time, as a change takes place with the production of toxic substances, probably similar to hydrocyanic acid, commonly called prussic acid, when high heat is used.

My attention was called to this matter years ago when I had two close calls. The first was a rugged patient aged 46, who did considerable public speaking and was bothered with hoarseness, caused by discharge from the posterior ethmoids. This patient had cocaine used in his nose for diagnostic purposes on various occasions and had shown no ill effect.

About this time I had another patient on whom a radical antrum operation had been performed, and cocaine had been used in her nose on numerous occasions.

The mixture that I was in the habit of using at that time was equal parts of 10 per cent cocaine and 1:1,000 epinephrine, making the solution about 5 per cent cocaine. I had never experienced any ill effects from using the cocaine on either one of these patients. When I made up the cocaine solution myself, I was careful not to boil it with a direct flame or place it in an autoclave. I usually made the cocaine solution by adding hot water to the cocaine hydrochloride crystals and placing the bottle in a water bath for a short time.

I had a number of tonsillectomies to be done under local anesthesia at the hospital and brought my own cocaine to perform the operations. On leaving the hospital I replaced the cocaine which I had used with some of the cocaine used in the hospital, and it was this solution which I had used on both of these patients. I might say that the hospital had sterilized the cocaine solution by placing it in an autoclave.

In making topical application to both of these patients, all symptoms similar to those described in the query took place; namely, pallor, followed by slight cyanosis, and convulsive seizures of the hands and face, which condition gradually spread over the body with unconsciousness, also slow and jerky respiration.

I immediately put the patients on the floor, elevating their feet with the head well lowered, and began artificial respiration, to which both responded. I feel sure that the cocaine solution which had been sterilized in the autoclave at the hospital and which had been used on these patients was the cause of the trouble, and the method of preparing it with high heat in an autoclave decomposed the cocaine with the production of very poisonous substances and caused the symptoms.

In conclusion I would suggest that:

1. Cocaine solution should always be made up fresh.
2. When used locally either topically or injected, it should be combined with epinephrine to prevent absorption.
3. The patient should be instructed to expectorate constantly and not swallow any going in the throat from the nose, as absorption takes place quickly from the stomach.
4. The solution should not be autoclaved.
5. Only cocaine from a reliable firm should be used.
6. The solution should be slightly acid.

E. A. STAPLETON, M.D., Albany, N. Y.

BRADYCARDIA (BELOW RATE OF 40) IN ATHLETES, ESPECIALLY IN LONG DISTANCE RUNNERS

To the Editor:—A few months ago a letter was sent to me referring to an article in *Collier's* about mile running as a sport, in which it was stated that Cunningham has a normal pulse rate of 38, whereas Les MacMitchell has a normal pulse rate of 32. As a matter of fact, these heart rates are not as they were actually stated in the article published in *Collier's* for June 7, 1941 (pages 19 and 48) under the title "Kid Mercury" by Stanley Frank. In that article Dr. George Deaver of the Department of Physical Education at New York University is quoted as saying "The boy (Les MacMitchell) has the amazing heart beat of 38, one of the lowest on record. . . . Cunningham's heart beat was 40, and I understand Nurmi's was 42. Those fellows will live a long, long time." This occurrence was questioned by the writer, and my first inclination was briefly to agree that a heart rate under 40 per minute does not normally exist, since I myself had not encountered or heard of such a bradycardia, although normal rates in the 40s and 50s are common. It seemed wise, however, first to inquire of others with considerable experience and, incidentally, to obtain first hand information from Cunningham and MacMitchell themselves. This research has been well worth while. Bradycardia caused by starvation does not have a place here, of course.

I have reviewed the electrocardiograms, and other evidence, of a small but clearcut group of four perfectly normal young men, all athletes, three of them long distance runners, and of one middle aged man with normal sinus rates graphically recorded at under 40 per minute. Actually the basal rates were measured at 38, 38, 37, 37 and 35: in order named these heart rates belonged to a Marathon winner, an aviator, a champion miler, a nonathletic middle aged man with slight hypertension and cardiac enlargement, and a champion two miler. Incidentally, Cunningham states that his heart rate has been noted as low as 45 at rest but not below 40, while MacMitchell, whose perfectly normal electrocardiogram, showing a rate of 37, he kindly sent me to examine, states that his heart beat at rest has dropped to as low as 31 per minute.

To Cunningham and to MacMitchell and to several physicians whom I have consulted, I would like to express my thanks. Also I would much appreciate hearing from others who have authentic information regarding heart rates under 40 per minute in normal persons. As an "exception that proves the rule," these observations are important and should be useful both as general information and in particular cases, in furthering our knowledge of the range of the normal heart.

PAUL D. WHITE, M.D., Boston.

VALSALVA'S METHOD OF INFLATING THE MIDDLE EAR

To the Editor:—In the September 5 issue, page 4, in Carson's article on otolaryngologic problems, the question of Valsalva's method of inflating middle ear is discussed and the statement made that holding the nose shut and swallowing raises the pharyngeal pressure. This experiment does not inflate the middle ear but deflates it when the drum has been bulged out by expansion of the air in the tympanic cavity. The experiment was first described by Toynbee (cited by Politzer, Adam: A Textbook of the Diseases of the Ear). Valsalva's method is to hold the nostrils closed with the fingers and then blow the air outward. Both methods may be useful in aviation, one in flying upward, the other in descending, but the two methods have directly contrary actions and should not be confused.

GEORGE MARTIN MCBEAN, M.D., Chicago.

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Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 15-16, 1943. Sec., Council on Medical Education and Hospitals, Dr. H. G. Weiskotten, 535 North Dearborn Street, Chicago.

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Oct. 17, page 561.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Part III.* New York, Oct. 26-28, and Boston, November 3-5. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written. Part I.* Various centers, Feb. 4. Final date for filing application is Nov. 6. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* Chicago, Dec. 4-5. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written. Part I.* Various centers, Feb. 13. *Oral. Part II.* May 1943. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral. All Groups.* New York, Dec. 13-16. Los Angeles, Jan. 15-16. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Oral and Written.* Chicago, Jan. 9-10. Final date for filing application is Nov. 1. Sec., Dr. Guy A. Caldwell, 3503 Prytania St., New Orleans.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Feb. 12. *Oral.* St. Louis, March 27-28. Final date for filing application is Dec. 1. New York, April 24-25. Final date for filing application is Jan. 1. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF UROLOGY. February 1943 (tentative). Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis.

California Reciprocity Report

The Board of Medical Examiners of the State of California reports 69 physicians licensed to practice medicine by reciprocity and 12 physicians so licensed by endorsement from February 4 through June 10. The following schools were represented:

School	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1939)	Arkansas
College of Medical Evangelists	(1934)	Penna., (1938) Arizona, (1939) Michigan, Wisconsin, (1940) Illinois
Stanford University School of Medicine	(1939)	Ohio
University of Colorado School of Medicine	(1939)	Colorado
George Washington University School of Medicine	(1919)	Dist. Colum. (1924) Ohio
Georgetown University School of Medicine	(1936)	Nevada
Bennett College of Eclectic Medicine and Surgery	(1915)	Illinois
Northwestern University Medical School	(1927)	Washington, (1932) Ohio, (1938), (1939) Illinois
Rush Medical College	(1907), (1916), (1935)	Illinois, (1935) Minnesota
The School of Medicine of the Division of the Biological Sciences	(1932)	Illinois,
University of Illinois College of Medicine	(1915)	Illinois, (1934) Washington, (1937) Louisiana, Wisconsin
Central College of Physicians and Surgeons, Indianapolis	(1898)	N. Dakota
Indiana University School of Medicine	(1929)	Indiana
State University of Iowa College of Medicine	(1919), (1933), (1934)	Iowa
University of Kansas School of Medicine	(1917), (1929), (1933), (1937), (1938)	Kansas
Louisiana State University Medical Center	(1936)	Georgia
Tulane University of Louisiana School of Medicine	(1934), (1936)	Louisiana
Harvard Medical School	(1935)	Minnesota
University of Michigan Medical School	(1936), (1938)	Michigan
University of Minnesota Medical School	(1933), (1935), (1936), (1941)	Minnesota
Washington University School of Medicine	(1935), (1939)	Missouri
Creighton University School of Medicine	(1934)	Nebraska
University of Nebraska College of Medicine	(1931)	Washington, (1934, 2) Nebraska
Cornell University Medical College	(1923)	New York
Long Island College of Medicine	(1921), (1926)	New York
New York Homeopathic Medical College and Flower Hospital	(1913)	New York
Syracuse University College of Medicine	(1923)	New York
Ohio-Miami Medical College	(1909)	Ohio
University of Cincinnati College of Medicine	(1924), (1927), (1937), (1941)	Ohio
Jefferson Medical College of Philadelphia	(1924), (1936)	Penna.
Temple University School of Medicine	(1936)	Wisconsin
University of Texas Faculty of Medicine	(1939)	Texas
McGill University Faculty of Medicine	(1922)	Illinois
Medizinische Fakultät der Universität Wien	(1928)	Illinois
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultása, Budapest	(1915)	Maine
Université de Genève Faculté de Médecine	(1933)	New York

School	LICENSED BY ENDORSEMENT Year Grad.	Endorsement of
College of Medical Evangelists	(1936, 2)	N. B. M. Ex.
Stanford University School of Medicine	(1932)	N. B. M. Ex.
Howard University College of Medicine	(1931)	N. B. M. Ex.
Northwestern University Medical School	(1934)	N. B. M. Ex.
Rush Medical College	(1938)	N. B. M. Ex.
Johns Hopkins University School of Medicine	(1926), (1932)	N. B. M. Ex.
Harvard Medical School	(1924), (1933), (1937)	N. B. M. Ex.
Long Island College of Medicine	(1912)	U. S. Army

Ohio June Report

The Ohio State Medical Board reports the written examination for medical licensure held at Columbus, June 16-19, 1942. The examination covered 11 subjects and included 85 questions. An average of 75 per cent was required to pass. Two hundred and fifty-three candidates were examined, 248 of whom passed and 5 failed. The following schools were represented:

School	PASSED Year Grad.	Number Passed
College of Medical Evangelists	(1942)	1
Yale University School of Medicine	(1941)	1
George Washington University School of Medicine	(1938), (1942)	2
Georgetown University School of Medicine	(1941), (1942)	2
Loyola University School of Medicine	(1942, 2)	2
Northwestern University Medical School	(1942, 4), (1942)*	5
University of Chicago, The School of Medicine	(1941)	1
Harvard Medical School	(1940)	1
University of Michigan Medical School	(1942)	1
Cornell University Medical College	(1942)	1
New York University College of Medicine	(1942)	1
Univ. of Rochester School of Medicine and Dentistry	(1942, 4)	4
Ohio State University College of Medicine	(1942, 77)	77
University of Cincinnati College of Medicine	(1942, 69)	69
Western Reserve University School of Medicine	(1942, 57)	57
University of Oregon Medical School	(1941)	1
Hahnemann Med. College and Hosp. of Philadelphia	(1941)	1
Jefferson Medical College of Philadelphia	(1941), (1942, 5)	6
Temple University School of Medicine	(1941, 2)	2
University of Pennsylvania School of Medicine	(1939, 2), (1942, 3)	5
University of Pittsburgh School of Medicine	(1942)	1
Marquette University School of Medicine	(1942), (1942)†	2
University of Wisconsin Medical School	(1940), (1941, 2)	3
University of Western Ontario Medical School	(1941)	1
Regia Università degli Studi di Modena. Facoltà di Medicina e Chirurgia	(1934)	1

School	FAILED Year Grad.	Number Failed
Creighton University School of Medicine	(1941)	1
Medizinische Fakultät der Universität Wien	(1924)	1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1904)	1
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main	(1919)	1
National University of Athens School of Medicine	(1935)	1

* This applicant received the M.B. degree and will receive the M.D. degree on completion of internship.

† This applicant completed four years' medical work and will receive the M.D. degree on completion of internship. License has not been issued.

Idaho July Report

The Idaho State Medical Examining Board reports the written examination for medical licensure held at Boise, July 13-16, 1942. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Ten candidates were examined, 9 of whom passed and 1 failed. One physician was licensed to practice medicine on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented.

School	PASSED Year Grad.	Number Passed
University of Southern California School of Medicine	(1939)	1
George Washington University School of Medicine	(1931)	1
Northwestern University Medical School	(1935), (1936)	2
University of Maryland School of Medicine and College of Physicians and Surgeons	(1936)	1
University Medical College of Kansas City	(1913)	1
University of Oregon Medical School	(1940), (1941, 2)	3

School	FAILED Year Grad.
State University of Iowa College of Medicine	(1930)

School	LICENSED BY ENDORSEMENT Year Grad.
University of Chicago, The School of Medicine	(1939)

Florida June Report

The Florida State Board of Medical Examiners reports the written examination for medical licensure held at Jacksonville, June 22-23, 1942. Eighty-seven candidates were examined, 81 of whom passed and 6 failed. The following schools were represented:

School	PASSED Year Grad.	Number Passed
College of Medical Evangelists	(1941), (1942)	2
Yale University School of Medicine	(1912), (1941)	2
George Washington University School of Medicine	(1942)	1
Emory University School of Medicine	(1917), (1942, 11)	12
University of Georgia School of Medicine	(1928), (1940), (1941)	3
Chicago College of Medicine and Surgery	(1914)	1
Loyola University School of Medicine	(1929)	1
Northwestern University Medical School	(1925)	1
Rush Medical College	(1940, 2), (1941)	3
The School of Medicine of the Division of Biological Sciences	(1938)	1
University of Chicago, The School of Medicine	(1941)	1
University of Illinois College of Medicine	(1926)	1
Indiana University School of Medicine	(1921)	1
State University of Iowa College of Medicine	(1942)	1
University of Louisville School of Medicine	(1926)	1
Tulane University of Louisiana School of Medicine	(1941, 2), (1942,7)	9
Johns Hopkins University School of Medicine	(1931), (1942)	2
University of Maryland School of Medicine and College of Physicians and Surgeons	(1942)	1
Harvard Medical School	(1919), (1941), (1942)	3
Detroit College of Medicine and Surgery	(1917)	1
University of Minnesota Medical School	(1930)	1
Washington University School of Medicine	(1940)	1
Cornell University Medical College	(1938)	1
Long Island College of Medicine	(1933, 2)	2
New York Medical College, Flower and Fifth Avenue Hospitals	(1941)	1
Duke University School of Medicine	(1939), (1940)	2
Eclectic Medical College, Cincinnati	(1919)	1
University of Cincinnati College of Medicine	(1941)	1
Western Reserve University School of Medicine	(1940)	1
Jefferson Medical College of Philadelphia	(1939), (1940), (1941)	3
Temple University School of Medicine	(1941), (1942)	2
University of Pennsylvania School of Med.	(1928), (1942, 2)	3
University of Pittsburgh School of Medicine	(1931)	1
Woman's Medical College of Pennsylvania	(1936)	1
Medical College of the State of South Carolina	(1941)	1
Meharry Medical College	(1941), (1942)	2
University of Tennessee College of Medicine	(1928), (1941, 2)	3
Vanderbilt University School of Medicine	(1915), (1942, 2)	3
University of Virginia Department of Medicine	(1942, 2)	2
University of Western Ontario Medical School	(1936)	1

School	FAILED Year Grad.	Number Failed
Rush Medical College	(1913)	1
University of Louisville School of Medicine	(1942)	1
Johns Hopkins University School of Medicine	(1912)	1
New York University College of Medicine	(1941)	1
Hahnemann Medical Col. and Hosp. of Philadelphia	(1942)	1
University of Pittsburgh School of Medicine	(1928)	1

Arkansas June Report

The Arkansas State Board of Medical Examiners reports the written examination for medical licensure held at Little Rock, June 4-5, 1942. The examination covered 12 subjects. An average of 75 per cent was required to pass. Sixty candidates were examined, all of whom passed. The following school was represented:

School	PASSED Year Grad.	Number Passed
University of Arkansas School of Medicine	(1942, 60)	60

Eleven physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from January 15 through June 30. The following schools were represented:

School	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
University of Illinois College of Medicine	(1937)	Texas
College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois	(1906)	Illinois
University of Louisville School of Medicine	(1940)	Mississippi
Tulane University of Louisiana School of Medicine	(1940)	Louisiana
St. Louis University School of Medicine	(1938)	Missouri
University of Nebraska College of Medicine	(1937)	Nebraska
University of Oklahoma School of Medicine	(1927)	Oklahoma
Temple University School of Medicine	(1939)	Tennessee
University of Tennessee College of Medicine	(1913) (1940), (1941)	Tennessee, Mississippi

School	LICENSED BY ENDORSEMENT Year Grad.
University of Arkansas School of Medicine	(1935)
Harvard Medical School	(1940)

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Act: Revocation of License for Unlawful Advertising.—The Missouri dental practice act authorizes the revocation of a dental license for unprofessional or dishonorable conduct, defined to include "(*a*) advertising, directly or indirectly, prices for professional services; (*b*) advertising, directly or indirectly, by means of large display, glaring light sign, or containing as a part thereof the representation of a tooth, teeth, bridge work or any portion of the human head; (*c*) employing or making use of, directly or indirectly, advertising solicitors or free publicity press agents. . . ." After a hearing, the dental board found the plaintiff, a licensed dentist, guilty of a violation of this section and revoked his license. The order of revocation was affirmed by the circuit court of St. Louis City, after a trial de novo, and the plaintiff appealed to the Supreme Court of Missouri.

The court could not agree with the plaintiff's contention that the law was so vague and indefinite as to violate the due process clause of the federal constitution. Reading the law as a whole, the court held that the term "professional services" was sufficiently defined for the purposes of the case by the section setting forth what constitutes the practice of dentistry. The term "indirectly," as used in the quoted provision, means not directly; obliquely; in a roundabout manner; dishonestly. The word "advertising" obviously embraces something beyond mere public speaking before civic or social organizations. It signifies giving public notice, especially by printed matter, such as circular letters, pamphlets, newspapers and magazines. The plaintiff contended that the words "advertising solicitors" mean solicitors of advertising and therefore do not make sense in their context. But the court pointed out that they may also mean solicitors who advertise, just as an advertising dentist would be a dentist who advertises. So also a "free publicity press agent" would be a press agent who obtains free publicity (not paid advertising) for the dentist. The expression "large display" signifies a display advertising exceeding most others of like kind in quantity or dimensions according to general opinion and common judgment. The plaintiff contended that the quoted provision was vague in that it was impossible to tell whether all of the acts mentioned must concur to constitute the conduct denounced or whether some one or more of them alone would offend. But, said the court, the provision runs in the disjunctive and the doing of any one of the several acts denounced constitutes unprofessional conduct.

The evidence, in the opinion of the court, was sufficient to support the order of revocation. The plaintiff operated two dental laboratories, the larger of the two having 5,000 square feet of floor space, one third of which was occupied by the laboratory and the remainder by dental offices. There was a line of demarcation between the offices and the laboratory, but they were communicating. Patients entering the place would be received by a common receptionist for the two enterprises. The laboratory was incorporated under the name "Dr. Rust Dental Laboratories, Inc." It advertised widely, but Dr. Rust personally did not after the new dental practice act went into effect in 1937. The contention of the dental board was that the laboratory corporation and its advertising were carried on to attract business to Dr. Rust and his subordinate dentists professionally. He was the head of both activities. The laboratory did the work of taking x-ray pictures, making dental plates, repairing and refurbishing them. The dentists would examine the teeth and render various kinds of professional services, such as extracting, treating or filling teeth, taking molds of teeth and gums and fitting the plates. Among other things the plaintiff had an advertising company prepare and place on the front and rear of streetcars in St. Louis advertising placards 21 by 27 inches which publicized the corporation and portrayed a full upper set of teeth in a gum or plate. The addresses given were those occupied by the two dental offices. Dr. Rust's name

was in large print, the word "Dentists" in smaller letters, and below these in much smaller print appeared "Lab. Inc." Unquestionably this advertising was intended to inure to the benefit of the professional side of the business.

The revocation of the plaintiff's license did not constitute cruel and unusual punishment. The court said that there were no extenuating circumstances so far as it could see. An offer of proof was made and excluded that the plaintiff was an advertising dentist in Chicago with nine offices until a regulatory law was passed in Illinois. Then he went to Wisconsin and practiced there as the Painless Parrmer Company until a regulatory law excluded him. *Rust* v. *State Board of Dental Examiners*, 216 Wis. 127, 256 N. W. 919, abst. J. A. M. A. 105:624 (Aug. 24) 1935. The present proceeding was heard by the Missouri dental board in March 1938. The trial in the circuit court occurred in June 1939. Some time that year before the trial the plaintiff had a pamphlet printed and circulated in St. Louis and vicinity at the head of which appeared his name, "Dr. A. J. Rust, Dentist," and his two office addresses. It was addressed "To the People of Missouri" and was a diatribe on the prevailing high charges in dentistry. It challenged the "Missouri's Dental Organization." On the witness stand the plaintiff characterized the dental board as a kangaroo court, said there was more mechanical skill than medical skill in dentistry and expressed the view that dentists should be allowed to advertise. He was against the law. The plaintiff's professional history and all this recalcitrance were competent evidence on the question of whether revocation of his license was cruel and unusual punishment. In conclusion, the court held that the judgment of the trial court affirming the revocation of the plaintiff's license was proper.—*Rust v. Missouri Dental Board, 155 S. W. (2d) 80 (Mo., 1941).*

Veterinary Practice Acts: Revocation of License for "Gross Moral or Professional Misconduct."—On the ground that the petitioner, a licensed veterinarian, had maintained a professional connection with and lent his professional name to a person not licensed as a doctor of veterinary medicine, the state board of veterinary medical examiners, after a hearing, revoked the petitioner's license to practice veterinary medicine. To review such order the petitioner appealed, by way of certiorari, to the Supreme Court of Minnesota.

The charges before the board were based on section 5851-8 of Mason Minn. St., 1940 Supp., providing for the revocation of a license "when the holder is guilty of gross moral or professional misconduct." On all the evidence the court was of the opinion that there was adequate basis for the revocation order. It appeared that the petitioner, who resided at Willmar where he maintained his home office, established a "branch office" at Melrose with one Johnson, a lay person, in charge. To acquaint the public with this fact, a display advertisement—no mere professional card—was inserted in the local newspaper. It occupied one eighth of an ordinary newspaper page and was in large type. The advertisement stated that the petitioner, as "Veterinary Surgeon," was about to open in Melrose a "Veterinary office." On its face, it advertised "G. A. Johnson" in large type as "Supply Mgr." The sick mare involved in the instant case belonged to a farmer who was about to call another veterinary when, at the suggestion of a fellow townsman of Johnson, the business was switched to him. Being informed of the mare's condition, Johnson agreed to and promptly did arrive at the farmer's home. In the interim, however, he had talked with the petitioner over long distance telephone and repeated what the farmer had told him. The ailment was diagnosed as spinal septicemia, and both oral and intramuscular treatment was prescribed. The petitioner instructed Johnson as to the treatment and agreed to come as soon as possible. Arriving at the farm, Johnson "looked at" the horse and administered the prescribed treatment. Later that evening the petitioner, and on subsequent occasions both the petitioner and Johnson, administered similar doses. The mare survived. The farmer paid for the "veterinarian service" (as indicated by his memoranda on the checks) the sum of $15.50. The two checks were payable to "G. A. Johnson and E. P. Walker." Both were cashed by Johnson. There was substantial denial that Johnson kept any of the money but in the opinion of the court the evidence was easily open to the inference that he did share in the payment. There was further testimony that over an area embracing at least three counties the petitioner maintained a network of "informers" in the persons of cream station operators, oil station attendants, restaurateurs and others likely to learn of occasion for veterinary service. Cards advertising the petitioner were placed in their establishments, and they were paid 25 cents for each telephone call made by them to the petitioner's "home office" informing him of a need for his service.

The petitioner contended that the statute, in its use of the general words "gross moral or professional misconduct" without limitation, explanation or definition, was void for uncertainty. To this the court could not agree. Complete certainty of definition is not required, especially when the attempt is to fix a standard of conduct rather than to condemn specific acts. In such case, the court continued, definition of the class of acts to which the statute applies must in the nature of things be general and comprehensive. The use of broad, flexible terms in fixing the standard is inescapable. Mere difficulty in ascertaining whether close cases fall within its operation does not nullify a statute if by the measure stated it can be determined with reasonable certainty whether particular conduct is disapproved. Continuing, the court said that it was not controlling but still notable that within any reasonable meaning of the statute, the activity of the petitioner was "professional misconduct." Procuring unauthorized practice or lending the professional name to another is a recognized professional misdeed.

On reargument, the court concluded that it had no power to modify the decision of the state board of veterinary medical examiners or to remand the matter for a rehearing. The board acted within its jurisdiction and the court could not say that it proceeded on other than a correct theory of law or that its action was arbitrary, fraudulent, oppressive or unreasonable. It was suggested, however, that the board had acted on the theory that its only power was to revoke the petitioner's license rather than to suspend it for a period. Whether that was so or not the court could not determine but stated that the power given to the board to revoke a license included the power to suspend. If the board acted on the assumption that it had no power to suspend, it proceeded on an erroneous theory and should grant a rehearing. The order of the board was affirmed, with the suggestion that if the board had acted under assumption that it had power only to revoke, it could reconsider the case.—*In re Walker's License, Walker v. Corwin, 300 N. W. 800 (Minn., 1941).*

Society Proceedings

COMING MEETINGS

American Academy of Pediatrics, Chicago, Nov. 4-7. Dr. Clifford G. Gruler, 636 Church St., Evanston, Ill., Secretary.

American Public Health Association, St. Louis, Oct. 27-30. Dr. Reginald M. Atwater, 1790 Broadway, New York, Executive Secretary.

American Society of Anesthetists, New York, Dec. 10. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.

Annual Conference of Secretaries of Constituent State Medical Associations, Chicago, Nov. 20-21. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.

Association of American Medical Colleges, Louisville, Ky., Oct. 26-28. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.

Association of Military Surgeons of the United States, San Antonio, Texas, Nov. 5-7. Colonel James M. Phalen, Army Medical Museum, Washington, D. C., Secretary.

Inter-State Postgraduate Medical Association of North America, Chicago, October 26-30. Dr. Arthur G. Sullivan, 16 North Carroll Street, Madison, Wis., Managing Director.

New York State Association of Public Health Laboratories, Albany, Nov. 6. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 26-30. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha, Secretary.

Puerto Rico, Medical Association of, Santurce, Dec. 11-13. Dr. E. Martinez Rivera, P. O. Box 3866, Santurce, Secretary.

Radiological Society of North America, Chicago, Nov. 30-Dec. 4. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.

Southern Medical Association, Richmond, Va., November 10-12. Mr. C. P. Loranz, Empire Building, Birmingham, Ala., Secretary.

Southern Surgical Association, Savannah, Ga., Dec. 8-10. Dr. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.

Western Surgical Association, Memphis, Tenn., Dec. 4-5. Dr. Arthur R. Metz, 2449 Washington Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

12:37-72 (Aug.) 1942

Modern Concept of Treatment of Compound Fractures. E. L. Compere, Chicago.—p. 37.
Some Common Errors in Treatment of Hypertension. F. W. Wilkerson, Montgomery.—p. 43.
Wound Healing and Closure of Wounds. S. L. Ledbetter Jr., Birmingham.—p. 46.
Use of Sulfonamides in Acute Otitis Media and Acute Mastoiditis. H. W. Frank, Gadsden.—p. 51.
Effect of Obstetric Sedation and Anesthesia on Newborn. H. Kennedy Jr., Birmingham.—p. 54.

American Heart Journal, St. Louis

26:141-288 (Aug.) 1942

Experimental Simulation in Dog of Cyanosis and Hypertrophic Osteoarthropathy Which Are Associated with Congenital Heart Disease. M. Mendlowitz and A. Leslie, New York.—p. 141.
Cardiovascular Effects of Paredrine. M. H. Nathanson, H. Engelberg and J. Hersh, Los Angeles.—p. 153.
*Isolated Myocarditis. O. Saphir, Chicago.—p. 167.
Note on More Accurate Measurement of Diastolic Blood Pressure. J. M. Read and J. S. Brown, San Francisco.—p. 182.
*Acute Coronary Thrombosis in Industry: II. Indirect Injuries from Toxic Gases and Other Physical Agents. H. D. Leinoff, New York.—p. 187.
Phonocardiographic Study of Heart Sounds in Acute Coronary Occlusion. A. M. Master and R. Friedman, New York.—p. 196.
Spontaneous Changes in Normal Rabbit Electrocardiogram. H. D. Levine, Bristol, N. H.—p. 209.
*Auricular Fibrillation of Long Duration in Rheumatic Heart Disease. C. E. Kossmann, Randolph Field, Texas, and C. A. R. Connor, New York.—p. 215.
Auricular and Ventricular Pericardial Frictions. P. Cossio, I. Berconsky and R. G. Dambrosi, Buenos Aires, Argentina.—p. 223.
Effect of High Altitude and Rebreathing on Duration of Electrical Systole in Man. M. S. White, C. E. Kossmann and I. Ershler, Randolph Field, Texas.—p. 230.
Study of Analeptic Value of Certain Drugs in Treatment of Quinidine Depression. S. A. Weisman, Minneapolis.—p. 240.

Isolated Myocarditis.—The routine examination of 5,626 hearts at necropsy disclosed 240 instances of myocarditis. This is exclusive of hearts of persons with contagious diseases and syphilis. Isolated myocarditis of the granulomatous variety was encountered in 1 and diffuse myocarditis in 14. Saphir presents clinical data on 13 patients. There were 12 instances of myocarditis and, although anatomically principally identical, neither clinically nor at necropsy were other lesions demonstrated which might be correlated with the myocarditis. The 1 patient with granulomatous lesions died suddenly without a history even suggesting disease. Nine of the 12 patients with diffuse myocarditis died suddenly. The death of 1 was attributed to coronary thrombosis. The twelve hearts were enlarged and dilated. There were no abnormalities in the pericardium or the endocardium. The myocardium was pale gray, often faintly tinged with yellow, with minute grayish streaks or larger areas of gray and white, which varied but corresponded roughly to the relative age of the disease. Microscopically the lesions were diffuse and principally interstitial, although muscle fibers were also involved. Lymphocytes and endothelial leukocytes were the most commonly encountered cells; polymorphonuclear and eosinophilic leukocytes were also seen. Mast cells seemed more numerous than usual. Transitions from the inflammatory cellular exudate to scar tissue were encountered, but these accumulations never resembled those of rheumatic myocarditis. The heart with the granulomatous myocarditis was about normal in size. Throughout the myocardium there were irregular, yellowish white areas which tended to fuse. In places they reached the endocardium and formed minute nodules. The pericardium showed no change. Conspicuous were a number of giant cells, with nuclear distribution more or less toward the periphery. The myocardium disclosed a diffuse infiltration predominantly of eosinophilic leukocytes and lymphocytes. Spirochetes or tubercle bacilli could not be demonstrated. Clinically the principal manifestations of isolated myocarditis, which is of unknown origin, in addition to the progressive myocardial failure, were a weak, rapid pulse, low arterial pressure and an increase in the area of cardiac dulness. Precordial pain may be present. The disease occurs at any age, although young people seem more frequently affected and therefore arteriosclerotic heart disease may be ruled out. Although nothing is known of the etiology, it seems imperative to examine other organs and structures for the causative agent, as in trichinosis or, perhaps, tularemia. A hypersensitivity, particularly to arsenic compounds, may possibly be responsible.

Acute Coronary Thrombosis in Industry.—The reaction of the heart of 10 industrial workers, who applied for compensation benefits, to indirect injuries caused by exposure to toxic fumes, electricity, infection and foreign proteins is discussed by Leinoff. The patients believed that certain incidents in the course of their employment had caused acute heart disease. The most common diagnosis was acute coronary occlusion, although a better diagnostic term would have been acute toxic myocarditis or coronary circulatory insufficiency. The amount of damage was usually in direct proportion to the offending force. The physical status of an organ determines the response to such trauma. Every effort should be made to check the patient's story so that a fair clinical conclusion can be made. Oxygen want, as systemic infection and foreign protein, results in an excessive demand on the heart, which, if prolonged, is followed by structural and functional changes. Electrical shock produces dysfunction without organic changes. In gas poisoning, blood tests should determine the qualitative and quantitative character of the toxin. The toxic action of gases depends on the concentration and length of exposure.

Auricular Fibrillation in Rheumatic Heart Disease.—Kossmann and Connor report 3 unusual cases of rheumatic heart disease with auricular fibrillation. The patients had mitral stenosis of rheumatic origin with auricular fibrillation respectively for fourteen, sixteen and twenty-one years. The abnormal rhythm began at an early age, and death occurred at 57, 33 and 45 years. This fact and other clinical data make it likely that rheumatic fever was the only etiologic factor involved in all. While under observation, aortic insufficiency developed in 1 and hypertension in another. Although congestive heart failure contributed to the death of each it was not the primary cause; the death of 1 was caused by gangrene of the ileum, and the sudden death of the other 2 suggested an embolic accident. One patient had four embolic accidents, two to the lungs and two to the lower extremities, exclusive of the final episode. The other 2 had no clinical evidence of embolization, except the terminal. Respectively for twelve, thirteen and fifteen years the 3 patients were gainfully employed despite the auricular fibrillation. Two of them were constantly under the influence of digitalis, while 1 took the drug irregularly.

American Journal of Clinical Pathology, Baltimore

12:339-398 (July) 1942

Demonstration of Association of Specifically Different Alpha Streptococci with Various Diseases and Methods for Preparation and Use of Specific Antiserums and Vaccines in Diagnosis and Treatment. E. C. Rosenow, Rochester, Minn.—p. 339.
Measles Encephalitis Complicated by So-Called "Fetal Endocarditis" and Gonorrheal Pyosalpinx: Report of Case. A. R. Peale and P. F. Lucchesi, Philadelphia.—p. 357.
Studies on Platelets: I. Method of Vilariño and Pimentel and New Direct Method of Counting Blood Platelets. A. L. Copley and T. P. Robb, Kansas City, Kan.—p. 362.
*Chronic Arthritis Associated with Neutrophilic Leukopenia, Splenomegaly and Hepatomegaly: "Felty's Syndrome." L. M. Lockie, S. Sanes and S. L. Vaughan, Buffalo.—p. 372.
Bacterium Necrophorus Septicemia in Man. V. B. Bubler, C. W. Seely and Dorothy D. Dixon, Kansas City, Mo.—p. 380.
Encephalopathy Following Neoarsphenamine. J. A. Tuta and J. Stagman, Chicago.—p. 387.

Chronic Arthritis (Felty's Syndrome).—Lockie and his co-workers report 2 cases in which chronic arthritis, splenomegaly and neutrophilic leukopenia was associated with hepatomegaly, slight enlargement of the lymph nodes, normocytic anemia, monocytosis, loss of weight and slight fever. These cases are considered as representative examples of

so-called Felty's syndrome in the broadest sense of the term. In the first case a chronic, nonspecific, inflammatory reaction was the chief manifestation. The spleen and nodes showed sinus endothelial hyperplasia, phagocytosis, infiltration of plasma cells and eosinophils and thickening of cords. In the liver there were parenchymatous degeneration, edema, swelling of Kupffer cells and interstitial hepatitis. The pathologic and pathogenic basis of "Felty's syndrome" is interpreted as arthritis in which not only the joints are affected but also other structures. Unless the essential features of the syndrome —splenomegaly, neutrophilic leukopenia and perhaps hepatomegaly—are thought of in relation with atrophic arthritis of adults they are liable to be detached pathogenically from the articular affliction and grouped separately under the guise of admittedly grave diseases, such as aplastic anemia, aleukemic leukemia, agranulocytosis, Hodgkin's disease, Banti's disease or as generalized specific infections such as tuberculosis and syphilis. These conditions must be excluded before a diagnosis is made. The first patient died two months after onset, apparently from neutropenia, splenomegaly and hepatomegaly. The second patient is alive four years after the signs of "Felty's syndrome" appeared. Splenectomy has been performed, but what salutary results it has produced in the patient's well being and blood count are apparently only temporary. High voltage roentgen therapy provided some general symptomatic relief but no benefit to the enlarged spleen or to the neutropenia.

American Journal of Diseases of Children, Chicago

64:211-400 (Aug.) 1942

Sexual Precocity Associated with Hyperplastic Abnormality of Tuber Cinereum. I. P. Bronstein, J. A. Luhan and W. B. Mavrelis, Chicago.—p. 211.
*Treatment of Gonorrheal Vulvovaginitis with Estrogens. W. E. Brown, Omaha.—p. 221.
Appearance of Ossification Centers: Groupings Obtained from Factor Analysis. M. Robinow, Yellow Springs, Ohio.—p. 229.
Optimal Reaction for Starch-Liquefying Activity of Duodenal Amylase of Infants. P. E. Rothman, Los Angeles; D. C. Widener and W. C. Davison, Durham, N. C.—p. 237.
Oral Prophylaxis for Poison Ivy Dermatitis in Children. L. Goldman, Cincinnati.—p. 241.
Isolation of Intestinal Pathogens from Preserved Stools of Children. Nell Hirschberg, Chicago.—p. 248.
Salmonella Cholerae Suis (Weldin) Bacteremia. E. Neter, Buffalo.—p. 255.
*Boeck's Sarcoid with Nodular Iritis in Child. Patti Sills Thornhill and E. H. Thornhill, Durham, N. C.—p. 262.
Nutritional Anemia in Infant Responding to Purified Liver Extract. P. J. Fouts and Elizabeth Garber, Indianapolis.—p. 270.
Physiologic Handicaps of Premature Infant: I. Their Pathogenesis. S. Z. Levine and H. H. Gordon, New York.—p. 274.
Id.: II. Clinical Observations. S. Z. Levine and H. H. Gordon, New York.—p. 297.
Serum Sickness and Anaphylaxis: Analysis of Cases of 6,211 Patients Treated with Horse Serum for Various Infections. F. G. Kojis, New York.—p. 313.

Estrogens for Gonorrheal Vulvovaginitis.—Brown successfully treated 13 cases of gonococcic and 6 of nonspecific vaginitis with estrogens. Sulfanilamide or another sulfonamide derivative had been tried for varying lengths of time but in each case they failed to cure the vulvovaginitis. All the children treated with estrogen were cured bacteriologically and clinically. If the cases are properly managed (vaginal cornification maintained continuously for four weeks) failure will be infrequent. The estrogens were given parenterally. Only a few patients were treated with diethylstilbestrol, and this was usually injected. The product and the dose used should be determined by the "physiologic unit," that is the amount necessary to cornify the vagina. The adoption of this unit has led to the use of much larger doses than are usually recommended. Complications which may be expected from this therapy are maturing of the genitals with the development of salpingitis and a permanent upset in the endocrine system of these young girls. The first complication did not occur, as the author has established a rule that estrogenic therapy shall not be used after a girl is 10 years of age or before if signs of early menarche (pigmentation and enlargement of the breasts, pubic and axillary hair or enlargement of the clitoris or labia) are present. In such patients there is cervicitis and not vaginitis, and all will have varying degrees of vaginal cornification. If this rule is followed salpingitis should be extremely rare, for three to four times the amount of estrogen is required to enlarge the uterus and open the tubes as it does to cornify the vagina. Experience with adult patients and women in the menopause points to only temporary effects of estrogen. A subsequent disturbance in the patient's endocrine balance therefore need not be expected.

Boeck's Sarcoid with Nodular Iritis.—Because of the rarity of ocular lesions in Boeck's sarcoid in children the Thornhills report such an occurrence in a Negro girl of 9. The differential diagnosis comprised tuberculous iritis, syphilitic iritis and Boeck's sarcoid. By physical examination, roentgenograms, intradermal tuberculin and Wassermann tests, repeated examinations of the sputum, inoculations of guinea pigs and microscopic study of a lymph node the diagnosis of Boeck's sarcoid was established. The course of the sarcoid is protracted with a decided tendency toward healing. The disease is rarely fatal. The patient was given a high calory, high vitamin diet containing cod liver oil, ascorbic acid, thiamine hydrochloride and brewers' yeast. One drop of 0.5 per cent atropine sulfate solution was used in the affected eye three times a day. During her stay in the hospital (four weeks) she had a temperature of 98.5 to 100.4 F. but seemed to feel fine, ate well and gained 1½ pounds (680 Gm.). The condition of the eye remained essentially the same; there was no improvement at discharge. One month later the vision in the affected eye (20/400) was unimproved. The corneal haze and descemetitis had cleared somewhat. Vascularization on the posterior surface of the cornea was seen. The pupil was poorly dilated, owing to posterior synechias. Large cystic nodules on the iris had cleared. In the iris on the nasal side were four compact pinhead size yellow granules. Pigmented deposits were still present on the anterior surface of the lens. The posterior segment could not be visualized. Roentgen study of the chest showed considerable regression of the enlargement of the lymph nodes, but the peripheral lung fields probably showed slightly more mottling than on previous examination. Roentgenograms of the hands, feet and long bones still revealed no cystic changes.

American Journal of Surgery, New York

57:193-386 (Aug.) 1942

*Precancerous Mouth Lesions of Avitaminosis B: Their Etiology, Response to Therapy and Relationship to Intraoral Cancer. H. Martin, New York, and C. E. Koop, Philadelphia.—p. 193.
Military Burns: Analysis of 308 Cases. L. F. Knoepp, Fort Benning, Ga.—p. 226.
Initial Treatment of Traumatic Wounds. J. L. Gallagher, Stockton, Calif.—p. 231.
*Operating Room Deaths: Study of Twenty-Three Consecutive Cases in Which Autopsies Were Performed. F. P. Turner and F. A. H. Wilkinson, Montreal, Canada.—p. 242.
Diagnosis and Treatment of Acral Gangrene. P. D. Abramson, Shreveport, La.—p. 253.
Traumatic Surgery: Diseases of Genitourinary Tract. E. K. Morgan, Brooklyn.—p. 275.
Stones in Ductus Choledochus: Analysis of 2,602 Cases of Biliary Tract Disease at St. Vincent's and Harlem Hospitals in Their Last 250,065 Hospital Admissions. M. C. O'Shea, New York.—p. 279.
Mortality Rate from Acute Appendicitis in a Municipal Hospital. L. R. Slattery and J. W. Hinton, New York.—p. 294.
Nonspecific Mesenteric Lymphadenitis. R. W. Postlethwait, Fort Myer, Va.; W. O. Self and R. P. Batchelor, Palmerton, Pa.—p. 304.
Differential Diagnosis and Treatment of Acute Abdominal Injuries: Method Employed at University of Minnesota Hospitals. C. E. Rea, St. Paul.—p. 316.
Roentgenographic Aid to Diagnosis of Left Subphrenic Disease. M. G. Wasch and B. S. Epstein, Brooklyn.—p. 321.
Gas Bacillus Infections Complicating Surgery of Upper Urinary Tract. J. A. Lazarus, New York.—p. 325.
Menstrual Cycle in Human Cervical Mucosa and Its Clinical Significance. A. Wellner, New York.—p. 331.
Metabolic Effects of Anesthetic Agents. S. Rochberg and Virginia Apgar, New York.—p. 336.
Simple Plastic Procedure of Fingers for Conserving Bony Tissue and Forming Soft Tissue Pad. E. DeJongh, Detroit.—p. 346.

Precancerous Mouth Lesions of Avitaminosis B.—Martin and Koop demonstrate from an analysis of the diets of 100 patients with precancerous stomatitis, 100 with oral cancer and 100 normal controls that degenerative and precancerous changes in the oral mucous membranes are among the important symptoms of deficiency disease and also that avitaminosis B is the greatest single cause of these precancerous lesions. The material was drawn from the Head and Neck Clinic at Memorial Hospital, where about 400 new cases of mouth and pharyngeal cancer are seen annually and from which at present about 1,500 active cases of oral cancer are being followed. In most cases of intraoral cancer there are

in addition to the primary lesions definite degenerative (precancerous) changes in the oral mucous membranes which antedate the malignant growth. These degenerative and precancerous changes are due to some mild chronic irritation. It is probable that the most responsible irritant is the stomatitis of avitaminosis B, although several concomitant factors may be operative. At least three apparently unrelated types of clinical observations support the theoretical role of the B complex in the etiology and symptomatology of mouth cancer: the vitamin deficiency natures of (1) cancer cachexia, (2) radiation sickness and (3) precancerous stomatitis of obscure origin. Their analysis of the dietary histories of 300 subjects led the authors to begin treatment with the routine administration of vitamin B, usually in the form of brewers' yeast, to all patients under treatment for intraoral cancer. The resultant beneficial effects were so gratifying that, although no methods for absolute statistical proof are as yet available, they nevertheless concluded empirically that the abnormal changes in the oral mucosa resulting from avitaminosis B are undoubtedly more prevalent and of more importance in the etiology of mouth cancer than any other single form of chronic irritation and possibly of greater significance than the sum total of all other etiologic factors. The abnormal changes of inadequate intake of the vitamin B complex vary widely, but generally the evidence is plain for at least a tentative diagnosis of avitaminosis B when an inflammatory lesion of the oral mucosa is associated with one or more of the following symptoms: malnutrition, mental depression, nervousness, insomnia, constipation, dermatosis and onycholysis. At the Memorial Hospital an investigation is in progress as to whether the incidence of an associated stomatitis (indicative of a B deficiency) is not more frequent in persons with esophageal, gastric and rectal cancer than in those not so afflicted.

Operating Room Deaths.—In searching for some feature common to the twenty-three operating room deaths that occurred in ten years at the Royal Victoria Hospital it became apparent to Turner and Wilkinson that in all but a few of them asphyxia or oxygen deprivation of the tissues was a factor of the greatest importance. The progression of oxygen want or anoxia in these cases could be followed clinically, and at necropsy the effect of this anoxia was readily seen. Therefore it follows that those patients who exhibit a relative anoxia prior to operation are operative risks. This is because the anoxia already existent is almost certain to be heightened by the preoperative medication, anesthesia and through shock due to psychic or surgical trauma secondary to the operation itself. The following conditions had a bearing on the cause of death of the 23 patients: aortic stenosis, carotid sinus reflex, "pleural shock," shock, status thymicolymphaticus, air embolism, anesthesia and hemorrhage.

Annals of Internal Medicine, Lancaster, Pa.

17:183-406 (Aug.) 1942

Diagnostic Criteria for Subphrenic Abscess Based on Study of 139 Cases. L. A. Hochberg, Brooklyn.—p. 183.
Respiration as Factor in Circulation of Blood. W. D. Reid, Boston.—p. 206.
*Role of Endocrines in Anaphylaxis and Allergy: I. Hormone Influences in Anaphylaxis; Critical Review: II. Hormone Influences in Allergy; Clinical Observations. L. Farmer, New York.—p. 212.
Periarteritis Nodosa: Report of Two Cases. L. A. Baker, Hines, Ill.—p. 223.
Electrocardiographic Changes in Old Age. T. T. Fox, J. Klenerts and E. E. Mandel, New York.—p. 236.
*Rocky Mountain Spotted Fever. G. E. Baker, Casper, Wyo.—p. 247.
*Portal System Thrombosis Occurring in Portal Hypertension. N. E. Reich, Brooklyn.—p. 270.
Diagnostic Sign of Spontaneous Interstitial Emphysema of Mediastinum: Case Reports. R. J. Griffin, Lexington, Ky.—p. 295.
*Occurrence of Peripheral Facial Paralysis in Hypertensive Vascular Disease. H. R. Merwarth, Brooklyn.—p. 298.
Has Real Increase in Lung Cancer Been Proved? Madge Thurlow Macklin, London, Ont., Canada.—p. 308.
Intermittent Claudication: Its Treatment with Insulin-Free, Deproteinated Pancreatic Extract (Depropanex). T. J. Fatherree and C. Hurst, Tacoma, Wash.—p. 325.

Endocrines in Anaphylaxis and Allergy.—Farmer concludes, from a review of studies on the hormone influence in anaphylaxis, that endocrine glands have a distinct influence on anaphylactic reactivity. The influence manifests itself in enhanced or in diminished reactivity. The alteration is due to changes in antibody formation or in the sensitized animal's capacity to react to renewed contact with the sensitizing antigen. The following observations are the bases for the foregoing assumptions: 1. Thyroidectomy prior to sensitization leads to a definite inhibition of precipitin formation (in rabbits) and to diminished severity of anaphylactic shock. 2. Thyroid in guinea pigs after completed sensitization enhances or diminishes the severity of anaphylactic shock, depending on the amount of thyroid administered. Thyroid in thyroidectomized sensitized rabbits and guinea pigs leads to normal or even excessive anaphylactic reactivity. 3. Hypophysectomy (in rats) prior to sensitization enhances the severity of the anaphylactic shock without exerting an influence on the production of precipitin. The influence of the endocrines on anaphylaxis has been established, but further experiments should be carried out stressing the quantitative considerations, sex and age of the animals. Ten cases of allergic conditions (hay fever and asthma) in women, evidently influenced by endocrinologic factors, are reported. Clinically they were related to the menstrual cycle, pregnancy and the menopause. Some were distinctly benefited by the administration of endocrine preparations and others by an ensuing pregnancy. The author does not attempt to explain the phenomena.

Rocky Mountain Spotted Fever.—An average of 600 cases of tick fever are reported in the western endemic area yearly, and at least 200 appear each year in the remainder of the country. Baker believes that these figures are conservative, as many cases are not recognized by physicians unfamiliar with the disease. The average mortality is approximately 12.5 per cent. Tick fever has potentialities for great dissemination. Because of the many people who vacation each year in the Rocky Mountain areas, the rapidity of present day transportation and the relatively long incubation period of the disease, infected persons may return home before any active manifestation is revealed and are cared for by physicians who have never seen a case of tick fever. Wider knowledge is essential, for the disease can in time assume proportions of national importance. The clinical picture is fairly typical, but confusion with other diseases is possible. Its prevention may be secured by simple precautions and by tick fever vaccine. At present its treatment is purely symptomatic and supportive. There is no recognized specific. Neoarsphenamine dissolved in an aqueous solution of metaphen is beneficial in rickettsial infections. Since tick fever has a striking clinical resemblance to endemic typhus, the two drugs were tried in 1934. Since then the author has had 3 to 4 cases of the disease under his care each season and all patients so treated have recovered. There has been less evidence of intoxication, minimal damage to the heart and kidneys and a more discrete, brighter colored nonhemorrhagic rash. Mental depression and nervous symptoms have been less severe. Convalescence was more rapid. The author is convinced that the drugs have a definite place in the therapy of tick fever.

Portal Thrombosis.—Ten cases of aseptic thrombosis occurring in portal hypertension, verified at necropsy or at operation, are reported by Reich with a discussion of the etiology, symptomatology and therapy. The cases occurred at the Kings County Hospital from 1934 to 1940. The duration of the immediate illness varied from one day to one year; half of the patients complained for less than one week before admission. Nine of the patients were males. The spleen was enlarged in all but 3 and could be palpated in only 1 patient, who presented Banti's syndrome. The liver of all presented cirrhotic changes of varying degrees, was definitely palpable in 4, and its weight in 4 was definitely increased. The abdominal fluid was bloody on two occasions and purulent once. Ascites was not present in only 1 patient. Abdominal pain appeared in varying intensity and location in 8, toxemia in 6, jaundice in 6, gastrointestinal bleeding in 4, intestinal obstruction in 3, constipation in 3 and diarrhea in 2. Associated pathologic lesions were cholelithiasis, primary hepatic carcinoma, Banti's syndrome, adenocarcinoma of the tail of the pancreas, nonspecific granuloma of the gallbladder and heart disease. Terminal bronchopneumonia occurred in 4, associated venous thrombosis in 5 and pulmonary vessel occlusion (embolism and thrombosis) in 2. The cases seem to fall into four anatomic groups: portal vein thrombosis in portal hypertension due to portal cirrhosis, superior mesen-

teric vein thrombosis with intestinal symptoms predominating, involvement of the smaller radicles of the portal system (esophageal and gastric plexuses and splenic branches) and portal system thrombosis associated with carcinoma. The many factors of varying importance in the production of aseptic thrombosis of the portal system in portal hypertension are blood flow changes, changes in the veins, gastrointestinal changes favoring thrombosis, syphilitic vascular changes and tuberculosis, postoperative thrombocytosis, pressure of ascitic fluid, traction of adhesions, increased viscosity of blood, introduction of intravenous tissue extracts, chemical and toxic factors, schistosomiasis, splenic anemia, Banti's syndrome and primary disease of the portal vein. The chronic symptomatology of the underlying disease should not be confused with that of the superimposed thrombosis. In cirrhosis with ascites, gastrointestinal symptoms and splenomegaly portal thrombosis may be easily overlooked.

Peripheral Facial Paralysis in Hypertension.—Merwarth reports 16 cases of paralysis of the peripheral portion of the facial nerve in hypertensive subjects resulting from hemorrhagic compression within the facial aqueduct. A likely source of hemorrhage is the petrosal artery. Interference with the blood supply from this vessel would also disrupt the circulation to the facial nerve trunk supplied by the vasa nervorum arising from the petrosal artery. Hemorrhage from or traction on the petrosal artery might possibly be the causative factor in producing the peripheral facial paralysis observed after operative approach to section of the posterior root. For hemorrhage to be a cause of facial paralysis the onset must be sudden, as it was in the 16 patients. This is true of hemorrhages in vascular rupture elsewhere in the nervous system. There was no preliminary pain or disturbance of taste. Some patients had previous attacks of hemiplegia or suffered from dizzy spells or headaches and were treated for existing vascular hypertension. The coexistence of high blood pressure with such an onset of paralysis should arouse suspicion of the possibility of aqueductal hemorrhage rather than inflammation as the cause of the paralysis.

Archives of Otolaryngology, Chicago

36:171-310 (Aug.) 1942

Use in Otolaryngology of Microcrystals of Drugs of Sulfanilamide Group. L. E. Silcox and H. P. Schenck, Philadelphia.—p. 171.
Chondroma of Larynx: Report of Two Cases in Which Laryngofissure Was Employed. E. T. Gatewood, Richmond, Va.—p. 187.
Elongated Styloid Process: Cause of Glossopharyngeal Neuralgia. L. H. Loeser and E. P. Cardwell, Newark, N. J.—p. 198.
Pedunculated Tumors of Esophagus. P. C. Samson, Oakland, Calif., and J. Zelman, San Bernardino, Calif.—p. 203.
Veins of Pharynx. O. V. Batson, Philadelphia.—p. 212.
Lucite Cell: New Method of Preservation of Wet Specimens. M. F. Snitman, Chicago.—p. 220.
Lymphatic Absorption from Auditory Bulla of Rat, with Special Reference to Lateral Sinus. R. W. Garlichs and J. Q. Griffith Jr., Philadelphia.—p. 226.
Hearing Aids Accepted by Council on Physical Therapy, American Medical Association. D. Macfarlan, Philadelphia.—p. 240.
Paranasal Sinuses. S. Salinger, Chicago.—p. 243.

Archives of Pathology, Chicago

36:319-472 (Aug.) 1942

Susceptibility of Heart of Rabbit to Specific Infection in Viral Diseases. J. M. Pearce, Brooklyn.—p. 319.
Effect of Thyroxine and Anterior Pituitary Growth Hormone on Enchondral Ossification: Species Used—the Rat. H. Becks, San Francisco; R. D. Ray, Boston; Miriam E. Simpson and H. M. Evans, Berkeley, Calif.—p. 334.
Secondary Tumors of Heart. P. A. Herbut and A. L. Maisel, Philadelphia.—p. 358.
Fibrinoid Necrosis in Arteriosclerosis. N. C. Schlossmann, New York.—p. 365.
Skeletal Abnormalities Induced in Rats by Maternal Nutritional Deficiency: Histologic Studies. J. Warkany and Rose C. Nelson, Cincinnati.—p. 375.
Clinical Significance of Pathologic Changes in Giant Follicular Lymphadenopathy. D. Symmers, New York.—p. 385.
*Kaposi's Sarcoma: Critical Survey. E. E. Aegerter and A. R. Peale, Philadelphia.—p. 413.
Effects of Radiation on Normal Tissues. S. Warren, Boston.—p. 443.
Pathologic Effects Produced by Deficiency of Single Metallic and Nonmetallic Elements. R. H. Follis Jr., Baltimore.—p. 451.

Kaposi's Sarcoma.—Aegerter and Peale report 4 cases of the disease commonly termed Kaposi's sarcoma. In 3 the process originated in the skin, and in 1 death occurred as the result of hemorrhage from a visceral metastasis. In the fourth the tumor was limited to the heart. The authors believe that the neoplasm in question is the cancerous representative of vascular tumors and that as such it should be called "angiosarcoma" and the term "Kaposi's sarcoma" should be reserved for the cutaneous subvariety.

Endocrinology, Springfield, Ill.

31:147-286 (Aug.) 1942. **Partial Index**

Quantitative Study of Antagonism of Estrogen and Progesterone in Castrate Rabbit. J. Gillman and H. B. Stein, Johannesburg, South Africa.—p. 167.
Antifibromatogenic Action of Natural Cortical Hormone (Dehydrocorticosterone of Kendall). A. Lipschütz and J. Zañartu, Santiago, Chile.—p. 192.
Effects of Lactogen on Normal and Adrenalectomized Female Rats. C. E. Tobin, Rochester, N. Y.—p. 197.
Studies in Corticoadrenal Function: I. Survival of Adrenalectomized Rats. J. Gillman and L. Goldberg, Johannesburg, South Africa.—p. 201.
Work Performance of Normal Rats Under Conditions of Anoxia. S. S. Dorrance, G. W. Thorn, F. H. Tyler and B. Katzin, Baltimore.—p. 209.
Carbohydrate Metabolism: I. Effect of B Vitamins on Liver Glycogen of Thyroid-Fed Rats. V. A. Drill, R. Overman and C. B. Shaffer, Princeton, N. J.—p. 243.
Comparative Gonadotropin Assays and Use of Calcium Phosphate as Adsorbent in Concentration of Follicle Stimulating Activity from Pituitary Gland. J. J. Cetthaml and F. C. Koch, Chicago.—p. 249.
Pituitary Weight of Growing Male Albino Rat Related to Body Weight. J. P. Mixner and C. W. Turner, Columbia, Mo.—p. 261.

Florida Medical Association Journal, Jacksonville

29:53-104 (Aug.) 1942

A Dermatologist in the Navy. L. M. Sompayrac, Jacksonville.—p. 63.
Splenomegalies with Surgical Indications. J. W. Snyder, Miami.—p. 66.
Diabetes Mellitus: Analysis of Cases Observed in Outpatient Department of Duval County Hospital During Last Fifteen Years. B. A. Dreibrodt and T. Z. Cason, Jacksonville.—p. 73.
Use of Eucupine for Prevention of Postoperative Pain in Proctologic Surgery. D. C. Robertson, Orlando.—p. 76.
Spinal Anesthesia. J. J. Ruskin, Tampa.—p. 79.
Multiple Myeloma. E. P. Preston, Miami Beach.—p. 82.

Georgia Medical Association Journal, Atlanta

31:303-346 (Aug.) 1942

Electric Shock Therapy in Personality Disorders. H. Cleckley and B. Beard, Augusta.—p. 303.
Chronic Fatigue States. J. C. Metts, Savannah.—p. 308.
Stilbestrol Treatment for Involutional Psychoses (Distaff). H. D. Allen, Milledgeville.—p. 312.
Neurotic Personality. W. W. Young, Atlanta.—p. 317.
The Nervous Patient, the Family Physician and the Consultant. E. F. Wahl, Thomasville.—p. 320.
Role of Nutrition in Mental Health and in Mental Disease. J. N. Brawner and J. N. Brawner Jr., Atlanta.—p. 321.
Military Neuropsychiatric Diseases of Present War. E. H. Parsons, Atlanta.—p. 324.
Georgia's Greatest Need—a State Teaching General Hospital. A. H. Bunce, Atlanta.—p. 330.
Chronic Pancreatitis with Congestive Splenomegaly and Esophageal Varices. M. S. Belle, Atlanta.—p. 333.

Journal of Clin. Endocrinology, Springfield, Ill.

2:421-476 (July) 1942

Control of Blood Sugar. D. R. Drury, Los Angeles.—p. 421.
Spontaneous Variability of Oral Glucose Tolerance. H. Freeman, J. M. Looney and R. G. Hoskins, Worcester, Mass.—p. 431.
Comparison of Effectiveness of Various Methods of Administration of Insulin. E. P. McCullagh and Lena A. Lewis, Cleveland.—p. 435.
Diethylstilbestrol for Hemostasis in Functional Uterine Hemorrhage. W. K. Cuyler, E. C. Hamblen and C. D. Davis, Durham, N. C.—p. 438.
Rationale of Estrogenic Therapy in Functional Dysmenorrhea. D. V. Hirst, E. C. Hamblen and W. K. Cuyler, Durham, N. C.—p. 442.
*Clinical Experiences with Oral Ethinyl Estradiol. B. A. Watson, Battle Creek, Mich.—p. 447.
Studies on Prostatic Cancer: V. Excretion of 17-Ketosteroids, Estrogens and Gonadotropins Before and After Castration. W. W. Scott and C. Vermeulen, Chicago.—p. 450.
Simple Easy Bruisability: Pseudohemorrhagic Diathesis of Probable Endocrine Origin. S. P. Lucia and P. M. Aggeler, San Francisco.—p. 457.
*Personal Note on Methyl Testosterone in Hypogonadism. J. P. Pratt, Detroit.—p. 460.
Hypothyroidism, Hyperlipemia and Carotenemia. T. Mandelbaum, S. Candel and S. Millman, Brooklyn.—p. 465.
Synergism Between Pituitary Extracts and Chorionic Gonadotropins. H. Gusman and M. A. Goldzieher, New York.—p. 468.

Oral Ethinyl Estradiol for Menopause.—Watson gave ethinyl estradiol orally to 18 women with menopausal symptoms. All patients were under treatment for two or more months and 1 for thirteen months. A toxic reaction, an urticarial rash, occurred in only 1 patient after taking only a small amount of the drug. This patient had had the same

reaction to diethylstilbestrol. Such a reaction might be a functional manifestation of a neurotic type. Relatively small doses of the ethinyl estradiol alleviated symptoms of the menopause, and uniformly good results were obtained.

Methyl Testosterone Therapy in Hypogonadism.—Pratt states that methyl testosterone orally initiated normal adolescent changes in a eunuchoid physician of 32. Toxic effects did not result from massive doses. There was a suggestion that tolerance to the substance may develop. Tolerance developed after six months, when 100 mg. daily was required to produce the response originally produced by 40 mg. Interruption of treatment for several weeks appeared to restore partial sensitivity to the hormone. The sole deleterious effect was a mild gynecomastia, which occurred only with larger doses.

Journal of Lab. and Clinical Medicine, St. Louis

27:1361-1494 (Aug.) 1942

Variations in Serum Magnesium in Health and Disease: Review. V. G. Haury, Philadelphia.—p. 1361.
Pharmacology of β (3,5 Diiodo-4-Hydroxyphenyl) a Phenyl Propionic Acid. W. Modell, New York.—p. 1376.
Occurrence of Trichinella Spiralis Larvae in Tissues Other Than Skeletal Muscles. Evelyn A. Mauss and G. F. Otto, Baltimore.—p. 1384.
*Treatment of Acute Mercury Poisoning with Sodium Formaldehyde Sulfoxylate: Review of Twenty Cases. R. Wolpaw and N. Alpers, Cleveland.—p. 1387.
Influence of Components of Vitamin B Complex on Recovery from Fatigue. E. E. Foltz, A. C. Ivy and C. J. Barborka, Chicago.—p. 1396.
*Cirrhosis of Liver: Results of Treatment with Parenterally Administered Amino Acids. I. D. Fagin and F. T. Zinn, Detroit.—p. 1400.

Acute Mercury Poisoning.—Wolpaw and Alpers administered sodium formaldehyde sulfoxylate to 20 patients with acute mercurial poisoning. All the patients had taken mercury bichloride in doses of from 7½ to 45 grains (0.5 to 3 Gm.). All vomited from five minutes to two hours after ingestion. The interval between its ingestion and therapy with sodium formaldehyde sulfoxylate ranged between fifteen minutes and thirty-six hours. Fourteen patients showed evidence of renal damage by changes in the urine. Colitis developed in 13. Mercury was found in the vomitus, washings or excreta in 16 of the 19 so examined. Of the 20 patients 16 recovered completely with no residual effects; 4 died. Anuria and uremia developed in 3 of these and 1 died in respiratory failure shortly after ingestion of the mercury, evidently from aspiration of vomited material or edema of the glottis. The doses of mercury bichloride of the 4 who died ranged from 22½ to 45 grains. The interval between ingestion and treatment ranged from thirty minutes to three hours. The high incidence of colitis even early in the course of the poisoning makes prompt high colonic irrigations especially significant. The importance of early and intensive treatment both oral and intravenous cannot be overestimated. The fact that the substance formed by combination of mercury and sodium formaldehyde sulfoxylate is toxic should not be overlooked, and supportive measures which encourage excretion by all routes must be maintained. Gastric lavage with the sulfoxylate is attended by certain dangers and requires careful individualized supervision, but until a more specific agent is discovered the drug deserves further trial.

Cirrhosis of Liver.—The effects of an amino acid mixture were investigated by Fagin and Zinn in 5 random patients with a clinical diagnosis of cirrhosis of the liver. Four of them were in the decompensated stage of portal cirrhosis and 1 was in the compensated stage. In all jaundice had subsided before the study was begun. The mixture was administered intravenously to make certain that it actually reached the liver. It was administered daily after breakfast for four weeks in undiluted form over thirty-five minutes to four and a half hours. Reactions were few and mild. The first dose caused 3 patients to have an increased number of normal stools. The increase was attributed to hypermotility of the colon. This reaction did not recur after the first day. Slight nausea, occasional vomiting or a slight elevation of temperature with chilly sensations were occasionally observed only during the first week of amino acid therapy. One patient after the month of treatment was generally greatly improved, 3 were moderately improved and 1 remained unchanged. The most striking result was shrinkage in the size of the liver and spleen, possibly attributable to resorption of intracellular fat in the liver, with ciculatory readjustments secondary to the improved portal circulation resulting in a decrease in splenic congestion. Peripheral edema subsided within two weeks after treatment. Laboratory data indicated an improvement in dextrose tolerance and in hippuric acid synthesis in all patients, and an improvement in bromsulphalein excretion in 1.

Journal-Lancet, Minneapolis

62:281-318 (Aug.) 1942

Benign Stricture of Esophagus: Complication of Duodenal Ulcer. E. M. Larson, J. A. Layne and L. L. Howard, Great Falls, Mont.—p. 304.
Elimination Diets for Study and Treatment of Food Allergy. A. H. Rowe, San Francisco.—p. 307.
Should the Hearing of College Students Be Tested? E. P. Fowler Jr., New York.—p. 312.

Journal of Nervous and Mental Disease, New York

96:125-244 (Aug.) 1942

Some Considerations of Electroencephalogram in "Convulsive State" (Electrically Induced Seizures). B. L. Pacella and S. E. Barrera, New York.—p. 125.
Psychopathology of Some Confusional States: Note Concerning Some Aspects of Pathologic Uncertainty. W. Muncie, Baltimore.—p. 130.
Report of Family Exhibiting Hereditary Mirror Movements and Schizophrenia. B. C. Meyer, New York.—p. 138.
Disorders of Conceptual Thinking in Brain-Injured Child. A. A. Strauss and H. Werner, Northville, Mich.—p. 153.
Subjective Experience in Asthma. P. L. Goitein, Boston.—p. 173.
*Some New Applications of Synthetic Vitamin E Therapy. G. A. Blakeslee, New York.—p. 184.
Narcissistic Arrest: Two Unusual Cases. L. Kerschbaumer, Clarinda, Iowa.—p. 191.

Synthetic Vitamin E Therapy.—Blakeslee used vitamin E therapy for 3 patients with peripheral neuritis associated with the Guillain-Barré syndrome, 1 with characteristic signs and symptoms of congenital amyotonia and 1 with the differential diagnosis between amyotrophic lateral sclerosis and muscular dystrophy of the Aran-Duchenne type. Each of the 5 patients showed definite improvement following the therapy. Further clinical trial of synthetic vitamin E in neuromuscular disorders is warranted by the encouraging effects observed in this and earlier studies.

Journal of Nutrition, Philadelphia

24:97-198 (Aug.) 1942. **Partial Index**

Influence of Aluminum Sulfate and Aluminum Hydroxide on Absorption of Dietary Phosphorus by Rat. H. R. Street, Rensselaer, N. Y.—p. 111.
*Thiamine Clearance as Index of Nutritional Status. D. Melnick, Long Island City, N. Y., and H. Field Jr., Ann Arbor, Mich.—p. 131.
*Vitamin B_1 (Thiamine) Requirement of Man. D. Melnick, Long Island City, N. Y.—p. 139.
Nicotinic Acid Content of Meat. W. J. Dann and P. Handler, Durham, N. C.—p. 153.
Cataract and Other Ocular Changes Resulting from Tryptophan Deficiency. J. R. Trotter and P. L. Day, Little Rock, Ark.—p. 159.
Nicotinic Acid, Pantothenic Acid and Pyridoxine in Wheat and Wheat Products. L. J. Teply, F. M. Strong and C. A. Elvehjem, Madison, Wis.—p. 167.
Relation of B Vitamins and Dietary Fat to Lipotropic Action of Choline. R. W. Engel, Auburn, Ala.—p. 175.

Thiamine Clearance as Index of Nutritional Status.—Four tests, the measurement of the basal twenty-four hour urinary excretion of thiamine, the fasting four hour excretion, the response to the oral administration of 5 mg. of thiamine and the four hour excretion of the vitamin when 350 micrograms per square meter of body area was administered parenterally, were used by Melnick and Field to determine the vitamin B_1 status of 37 normal and deficient adult subjects. All normal subjects, but none of the deficient ones, excreted more than 50 micrograms of total thiamine during the four hour period after parenteral injection. The omission of the major meal on the day when the parenteral test dose is given serves to counteract the minimal therapeutic value of the dose, so that the nutritional status of the subject during prolonged study is not significantly changed. Furthermore, the major portion of the parenteral test dose is excreted within the first four hours, so that no carryover effects are noticed.

Thiamine Requirement of Man.—More than 175 normal and deficient subjects were used by Melnick to determine the thiamine requirement of man through urinary excretion studies. In the deficient subject dietary thiamine is conserved to replenish

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depleted tissue stores and not wasted by urinary excretion. When a test dose of thiamine was superimposed on the dietary intake the extra vitamin was conserved or wasted (excreted), depending on the nutritional status of the subject. Objective thiamine balance studies indicate that the vitamin B_1 requirement of the adult is 350 micrograms per thousand calories. The recommended daily intake is 500 micrograms per thousand calories. Only 73 per cent of the so-called normal subjects, who were not restricted as to choice of diet, excreted sufficient quantities of thiamine in the urine to pass all the thiamine clearance tests.

Journal of Pharmacology & Exper. Therap., Baltimore

75:283-382 (Aug.) 1942. **Partial Index**

Effect of Various Pharmacologic Agents on Morphogenetic Actions of Estradiol. S. Albert and H. Selye, Montreal, Canada.—p. 308.
Bronchial Antispasmodic Actions of Theophylline Derivatives, Including Effects of Continued Administration. F. P. Ludueña, San Francisco.—p. 316.
Deacetylation of Heroin and Related Compounds by Mammalian Tissues. C. I. Wright, Bethesda, Md.—p. 328.
Development of Tolerance to Demerol. H. L. Andrews, Lexington, Ky.—p. 338.
Gastrointestinal Absorption of Lanatoside C. J. M. Dille and G. B. Whatmore, Seattle.—p. 350.
Studies on Sulfonamide Resistant Organisms: II. Comparative Development of Resistance to Different Sulfonamides by Pneumococci. Clara L. Sesler and L. H. Schmidt, Cincinnati.—p. 356.

Journal of Thoracic Surgery, St. Louis

11:571-678 (Aug.) 1942

Atelectasis and Bronchiectasis: Experimental Study Concerning Their Relationship. J. Tannenberg, Bedford Hills, N. Y., and M. Pinner, New York.—p. 571.
Method of Treatment of Large Pulmonary Air Cysts (Balloon Cysts) by Endocutaneous Flap. A. L. Brown and W. Brock, San Francisco.—p. 617.
Surgery of Chest in War. A. L. Lockwood, Toronto, Canada.—p. 637.
Primary (?) Melanoma of Lung: Case Report. G. A. Carlucci and R. C. Schleussner, New York.—p. 643.
Useful Devices for Thoracic Service. W. H. Oatway Jr. and J. W. Gale, Madison, Wis.—p. 650.
Experiments in Intracardiac Surgery: I. Bacterial Endocarditis. D. E. Harken, Boston.—p. 656.

Medical Annals of District of Columbia, Washington

11:291-330 (Aug.) 1942

"Blitz" Psychotherapy. B. Karpman, Washington.—p. 291.
Responsibility of Hospital Obstetric Staff Conference in Maternal Welfare. P. F. Williams, Philadelphia.—p. 297.
Treatment of Conditions Causing Frequency and Dysuria in the Female. W. P. Herbst, Washington.—p. 300.
Glycogen Storage Disease of Heart: Report of Case. B. J. Walsh, Washington.—p. 303.

Michigan State Medical Society Journal, Muskegon

41:613-708 (Aug.) 1942

Use and Abuse of Barbiturates. W. D. McNally, Chicago.—p. 635.
Tumor of Adrenal Cortex in Child of Fifteen Months. R. M. Kempton and O. W. Lohr, Saginaw.—p. 643.
Code of Medical Ethics. A. M. Schwitalla, St. Louis.—p. 646.
*Boric-Butyn-Petrolatum Gauze Treatment of Burns. G. K. Hughes, Columbus, Ohio.—p. 655.
Child Health in National Defense Program. B. S. Veeder, St. Louis.—p. 656.
Chemical Injuries of Eyes. M. H. Pike, Midland.—p. 661.

Boric-Butyn-Petrolatum Gauze Treatment of Burns.—Hughes has had gratifying results in the treatment of burns of various degrees of severity with an easily available prepared dressing consisting of 40 strips of 3 by 15 inch gauze, 60 Gm. of boric acid, 30 Gm. of 2 per cent butyn and sufficient petrolatum to impregnate the gauze in the autoclave. The general principles of cleansing and débridement are carried out and then the boric-butyn-petrolatum gauze is applied in strips of one layer thickness. A sterile dressing is superimposed. The burned area is redressed every two to three days after it is sponged with saturated boric acid. The only two disadvantages of the method are the difficulty in bandaging large areas and the necessity of redressing every two to three days, but its advantages are that the method is simple, the preparation is easily available, a clean wound, always under observation, is had, the patient is comfortable and the dressing is nonadherent. Comparison between silver nitrate-tannic acid and the boric-butyn-petrolatum gauze method showed that the side treated with the gauze had healed by the ninth day, whereas the side having the eschar required several additional days. No infection or destruction of viable epithelium was apparent in any of the cases.

Psychoanalytic Quarterly, Albany, N. Y.

11:287-458 (July) 1942

Some Forms of Emotional Disturbance and Their Relationship to Schizophrenia. Helene Deutsch, Cambridge, Mass.—p. 301.
Is There a Homeostatic Instinct? D. W. Orr, Seattle.—p. 322.
Transition Rites. G. Róheim, New York.—p. 336.
Contributions of Havelock Ellis to Sexology. B. Freedman, New York.—p. 375.

Public Health Reports, Washington, D. C.

57:1079-1114 (July 24) 1942

Studies of Acute Diarrheal Disease: IX. (A) Shigella Dysenteriae Infections Among Institutional Inmates. A. V. Hardy, Rebecca L. Shapiro, H. L. Chant and M. Siegel.—p. 1079.
Id.: IX. (B) Shigella Dysenteriae Infections Among Institutional Inmates. J. Watt, A. V. Hardy and Thelma DeCapito.—p. 1095.

57:1115-1154 (July 31) 1942

Mental Hygiene Services in Rural Areas: Program of Mental Hygiene Division, Suffolk County Department of Health, New York. G. M. Lott.—p. 1115.
Transmission of Rubella to Macaca Mulatta Monkeys. K. Habel.—p. 1126.

South Carolina Medical Assn. Journal, Florence

38:203-234 (Aug.) 1942

Diagnostic Significance of Various Types of Pain in Back Derangements. W. R. Mead, Florence.—p. 203.
The Question Box. N. B. Heyward, Columbia.—p. 208.

Southwestern Medicine, El Paso, Texas

26:215-248 (July) 1942

American Medicine and National Emergency. H. S. Rogers, Petaluma, Calif.—p. 216.
Obstructive Jaundice. V. C. Hunt, Los Angeles.—p. 220.
Usefulness of Laughter. E. F. Boyd, Los Angeles.—p. 224.
Bone-Holding-Drilling Forcep. F. C. Goodwin and D. M. Cameron, El Paso, Texas.—p. 228.

Texas State Journal of Medicine, Fort Worth

38:245-304 (Aug.) 1942

Medical and Public Health Aspects of Trichinosis. J. B. McNaught, San Francisco.—p. 252.
Laboratory Diagnosis of Trichinosis. J. B. McNaught, San Francisco.—p. 255.
Laboratory Observations on Virus Encephalitis. S. W. Bohls and J. V. Irons, Austin.—p. 260.
Management of Gonorrhea in the Indigent Male. B. Hay, Austin; H. Spence and E. W. Featherston, Dallas.—p. 264.
Preoperative and Postoperative Problems in Surgery. W. H. Hamrick, Houston.—p. 269.
Evaluation of Sister Kenny Method of Treating Infantile Paralysis. H. E. Hipps, Marlin.—p. 274.
Puerperal Paravaginal Hematoma. Annie T. Lamm and H. Lamm, La Feria.—p. 276.
Renal Arteriography: Its Clinical Value. A. K. Doss, H. C. Thomas and T. B. Bond, Fort Worth.—p. 277.
Otolaryngologic Problems in Aviation Medicine. C. M. Kos, Randolph Field.—p. 281.
*Rhinosporidiosis in Texas. J. G. Pasternack, Staten Island, N. Y., and C. S. Alexander, Houston.—p. 285.
Civilian Defense in National Emergency. G. W. Cox, Austin.—p. 288.

Rhinosporidiosis in Texas.—Pasternack and Alexander state that of the 12 cases of human rhinosporidiosis reported in the United States 4 occurred in Texas, and 3 of these were seen in Houston. Texas being a livestock state, an animal reservoir may be present. The source of infection is unknown, but good epidemiologic evidence indicates that in certain localities the disease is probably water borne. All attempts to transmit the infection to lower animals and to grow the organism on various artificial mediums have failed. Attempts to germinate the spores have likewise been unsuccessful. The treatment of an early accessible single growth is to excise it and the surrounding area of healthy mucous membrane or skin. The treatment of an inaccessible growth is excision of the tumor and destruction of the surrounding area, preferably with the electric cautery.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Lancet, London

2:29-58 (July 11) 1942

Etiology: Plea for Wider Concepts and New Study. J. A. Ryle.—p. 29.
*Infection by Nonhemolytic Group A Streptococci. L. Colebrook, S. D. Elliot, W. R. Maxted, C. W. Morley and Mary Mortell.—p. 30.
*Anemia in Women and Children on Wartime Diets. Helen M. M. Mackay, R. H. Dobbs, Lucy Wills and Kaitilin Bingham.—p. 32.
*Convulsions Following Percaine Local Anesthesia. G. Organe.—p. 33.
Hospital or Domiciliary Confinement? Mathilda F. Menzies.—p. 35.
Illness in Smallpox Contacts. J. C. Bowe.—p. 38.
Hyperpyrexia Due to Hysteria. F. P. Duras.—p. 39.
Death from Phenothiazine Poisoning. D. R. Humphreys.—p. 39.

Nonhemolytic Streptococci.—According to Colebrook and his colleagues, nonhemolytic streptococci were predominant in swabs from 13 patients with local infection—7 of the patients had fever or suppuration—clinically resembling that due to the ordinary group A hemolytic streptococci. All the thirteen strains reacted with group A serum (precipitin test); eleven were agglutinated by type 12 serum and also absorbed agglutinin from it. The other two strains gave a type specific reaction with type 11 and type 25 serums. The eleven infections with type 12 strains followed a period in which hemolytic strains of type 12 had been spreading in the wards. Both the hemolytic and the nonhemolytic strains were insensitive to sulfanilamide. The mode of spread of these nonhemolytic strains remains obscure. They were derived from patients in five different wards, one of which was half a mile from the others.

Anemia in Women and Children on Wartime Diets.—Between September 1941 and January 1942 Mackay and her associates determined the hemoglobin concentration of 1,074 persons living in London and the home counties; 364 children 6 months to 5 years, 128 school children 5 to 15 years, 38 factory girls 14 to 18 years and 544 nurses, medical students, factory hands and housewives more than 18 years of age. The results reveal a disquieting increase in anemia among the women and children. The mean hemoglobin of the nurses at a London teaching hospital was 90.6 per cent. That of the women students away from the hospital in London for two or more months was 84.1 per cent. These figures are both low in comparison with Price Jones's mean of 98.2 per cent for a strictly comparable group of nurses and women students in London and with Jenkins and Don's mean of 99.7 per cent for representative groups of supposedly healthy British women before the war. Of the London group 39 per cent and of the country group 83 per cent had values below the 90 per cent set by Price Jones. The women with the highest average hemoglobin level, 94 per cent, were workers at a factory in a small town near London. They lived in their own homes and may have been able to supplement their rations with country produce. The East End housewives had an average hemoglobin level of 89.6 per cent. There was a high incidence of anemia among the children, the mean hemoglobin values being 75.4 per cent at 6 to 12 months, 72.8 per cent at 1 to 2 years and 81.8 per cent at 4 to 5 years. The highest mean hemoglobin values were those of children living in their own homes and attending welfare centers; the lowest were those of children in residential nurseries. The average hemoglobin level of county council school children 5 to 13 years of age was about 80 per cent and for those between 13 and 15 years of age it was 89 per cent. The adolescent factory girls had a higher hemoglobin level than any other group of any age studied. Their mean hemoglobin value was 98 per cent. The authors suggest that the present increase of anemia in women and children should be combated by educating the public concerning their special need to obtain a full share of iron-containing foods, including meat, by extending schemes for supplementing the diet of school children and pregnant and nursing mothers, and by the provision of an iron-fortified milk and iron mixtures for babies and children. A dietetic survey made it clear that hospital and other institutional diets, particularly those of emergency hospitals in the country, should be under constant review.

Convulsions Following Nupercaine Local Anesthesia.—In February 1941 generalized convulsions developed in a man after the injection of 1:1,000 nupercaine in isotonic solution of sodium chloride for a subcostal field block. The patient died on the operating table. In June and again in November Organe encountered instances with similar convulsions, fortunately without fatal result. The procedure had been used for some time without incident. In the first and third cases an overdose of nupercaine may have been responsible for the convulsions, although similarly large doses had been given on previous occasions in other cases without any untoward effect. The amount should be limited to 15 cc. of the 1:1,000 solution per stone (6.4 Kg.) of body weight, and in its calculation allowance should be made for the presence of large tumors whose poor blood supply excludes them from sharing in its rapid absorption. In the second case the dose was correct, and was in fact less than that used on a later occasion, but severe jaundice and fever were present. In the presence of such complications it would probably be advisable to dilute the nupercaine to 1:2,000 and to use the calculated dose. This principle should probably be applied to all local anesthetic agents. The convulsions must be controlled early or else the patient will certainly die. Pentothal should be used even in the presence of circulatory collapse. Pentothal is preferable to pentobarbital or barbital, as their prolonged action is not necessary for the control of the convulsions and will add to the general depression. The dose must be minimal. Artificial respiration with oxygen is necessary and the circulatory depression will respond to saline solution intravenously. If necessary, epinephrine or ephedrine in minimal doses may be given to control the convulsion.

Medical Journal of Australia, Sydney

1:671-688 (June 20) 1942

Influenza Virus B: I. Observations on Growth in Chick Embryos and on Occurrence of Antibodies in Australian Serum. F. M. Burnet.—p. 671.
*Id.: II. Immunization of Human Volunteers with Living Attenuated Virus. F. M. Burnet.—p. 673.
Electrical Convulsive Therapy. H. M. Birch.—p. 675.
Abbreviated Wassermann Test. A. E. Finckh.—p. 678.

1:689-708 (June 27) 1942

Recollections of Emigration Service to Australia in Sailing Ships in Long Past Years. R. S. Skirving.—p. 689.
Some Problems in Treatment of Peptic Ulcer. H. C. R. Darling.—p. 697.

Influenza Virus B.—Burnet observed that antibody responses of human subjects to immunization with partially attenuated strains of influenza virus A were almost wholly limited to subjects with a low initial antibody titer. The experiments in volunteers have revealed a uniform immunologic response and offer presumptive evidence that an increased resistance to influenza virus B is induced in such subjects. The volunteers had a suitably prepared virus sprayed into the nose and the back of the throat. A blood sample was taken immediately and in three weeks; the two serum samples were compared for any change in antibody content. The virus used was derived from the mouse passage strain "Lee." No serious symptoms followed the spraying. Of those who on subsequent testing showed a rise in serum antibody level and therefore were presumably infected by the virus, 6 showed no symptoms, 2 noticed some increase in nasal secretion and stuffiness two days after inoculation, while 1 observed no nasal symptoms but had labial herpes five days after the inoculation. Normally, in him, herpetic attacks were induced by colds. A child of 10 given mixed virus, but reacting only to the B component, had a sharp onset of coryza with sneezing forty-eight hours after the administration. Serous nasal discharge and obstruction persisted for two days, but there were no toxic symptoms and no mucopurulent discharge. One subject showed a slight rise of antibody level by mouse test

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but none by Hirst's method and had a severe headache two days after inoculation but no fever or catarrhal symptoms. Therefore the strain appears capable of producing only trivial symptoms in only a few of those showing an active antibody response. The technic may provide a useful method of immunization against influenza virus B.

Vida Nueva, Havana

69:169-216 (May) 1942. **Partial Index**

*Colloidal Gold Reaction of Blood Serum in Diagnosis of Diseases of Liver. R. Lavin, A. Sellek and A. del Prado.—p. 203.

Colloidal Gold Reaction of Blood Serum in Diagnosis of Diseases of Liver.—Lavin and his collaborators resorted to the colloidal gold test for diagnosis of diseases of the liver in a group of 50 patients, adults and children with and without diseases of the liver and in a group of 20 normal children and adults for control. The test was carried out according to Gray's technic with some technical refinements in the preparation of the colloidal gold solution. The van den Bergh, bromsulphalein, galactose and Takata-Ara tests were also done on some patients (adults and children), whereas in adults the condition of the liver was verified by puncture biopsy, a surgical intervention or a necropsy. The test gave positive results in the blood serum of 7 out of 10 children with liver enlargement and strongly positive results in the blood serum of six children with syphilitic hepatitis, cirrhosis of the liver or catarrhal jaundice. It gave also positive results in the blood serum of 5 adults with cirrhosis of the liver, 2 adults with fatty degeneration of the liver, 2 with heart disease and liver stasis, 1 with jaundice and yellow degeneration of the liver, 2 with jaundice and 3 out of 5 with Parkinson's disease. The test gave negative results with the blood serum of children with nephrosis, polyserositis, tuberculous peritonitis and rheumatism and in that of 2 out of 5 adults with Parkinson's disease, in an adult with normal liver and an erroneous diagnosis of cirrhosis of the structure in 1 with jaundice and in patients with chronic heart disease as well as in those with primary tumor of the stomach with metastases in the liver and chronic gallbladder diseases. In the blood serum of 10 patients with syphilis and without any liver damage and in 19 out of 20 normal persons the test gave constantly negative results. The authors conclude that the colloidal gold test as practiced on the blood serum is one of the most sensitive liver function tests. They advise its routine use, together with other liver function tests, particularly the Takata-Ara reaction, which is specific for the diagnosis of cirrhosis.

Zeitschrift für klinische Medizin, Berlin

393-540 (Aug. 29) 1941. **Partial Index**

Observations on Four Cases of Nontropical Sprue. E. Balzer.—p. 393.
*Influence of Nutrition on Circulating Quantity of Blood: Deficient and High Sodium Chloride Content of Diet. G. Krauel.—p. 459.
Cysteine and Ascorbic Acid. W. Beiglböck and L. Benda.—p. 478.
*Behavior of Vitamin C Content of Blood During Insulin Shock. H. Haid.—p. 485.
Insulin Treatment of Diabetes Mellitus. W. Wohlenberg.—p. 502.
*Action of Insulin Shock on White Blood Picture of Patient with Allergy. F. Rausch and H. Bartelheimer.—p. 522.
*Potassium as Tissue Diuretic. H. W. Bansi and E. Schwartz.—p. 532.

Sodium Chloride in Diet and Blood Volume.—Krauel was interested not so much in the absolute values of the quantity of circulating blood as in the changes effected by increased and decreased sodium chloride intake. The determinations were always made on fasting persons who had had at least one hour of bed rest before the test was begun. First blood was withdrawn from the ear lobe for the determination of the hematocrit value. The quantity of plasma was ascertained by means of a dye method using a 1 per cent sterile solution of congo red. Studies were made on four groups of persons: (1) on normal persons who received a diet deficient in sodium chloride, (2) on patients with cardiovascular disorders who had received the same type of salt deficient diet, (3) on normal persons who had been subjected to daily sodium chloride tolerance tests of 20 Gm. and (4) on patients with cardiac disorders who had received daily from 10 to 20 Gm. of additional sodium chloride. In healthy persons the circulating quantity of blood decreased after several days of salt free diet. In patients with cardiovascular disease the reduction in circulating blood is not pronounced under the influence of salt free diet if no cardiac remedies are given at the time. Salt free diet alone does not reduce the quantity of circulating blood of the majority of patients with heart disease. Daily oral administration of 20 Gm. of sodium chloride effects in healthy subjects, in the course of several days, a noticeable increase in the quantity of blood, without the manifestation of subjective complaints. Patients with cardiovascular disorders react to the administration of sodium chloride regularly with a considerable increase in the quantity of blood, and this increase often has an adverse effect on the clinical picture.

Behavior of Vitamin C During Insulin Shock.—Haid cites investigations which indicate that vitamin C plays an important part in the carbohydrate metabolism. He studied the vitamin C content of the blood in connection with the administration of large doses of insulin. The vitamin C content was determined before the injection of insulin, during the insulin shock and about six hours after the cessation of the shock. The vitamin C content of the blood decreased noticeably during the insulin shock. It is assumed that this is due to the fact that the vitamin wanders from the blood stream into the tissues, but particularly into the liver. There is evidence that it is the fact that vitamin C is a reducing agent which is responsible for its interference in the insulin shock. At any rate the decrease in the vitamin C content during insulin shock is a further proof of its close relationship to the carbohydrate metabolism.

Insulin Shock and White Blood Picture in Allergic Patients.—Rausch and Bartelheimer demonstrate that the therapeutically employed insulin hypoglycemia produces in patients with asthma a change not only in the allergic manifestations but also in the white blood picture. Depending on the intensity of the increase in leukocytes produced by the insulin shock, two groups can be differentiated: asthmatic patients without inflammatory symptoms, in whom the total leukocyte count is at the most doubled, and those with accompanying inflammation in whom it increases to two, three or four times the previous count. The neutrophil granulocytes are the ones which show the greatest increase during the augmentation in the total leukocyte count. The lymphocytes rise parallel with the neutrophil granulocytes until the maximum shock is reached, but thereafter the lymphocytes decrease rapidly. The eosinophils, after a preliminary increase, always decline below the initial value, toward the end of the insulin shock. The eosinophils remained uninfluenced in a patient with urticaria factitia. If epinephrine and histamine are injected at the height of the insulin shock there is a brief further increase in leukocytes.

Potassium as Tissue Diuretic.—Bansi and Schwartz say that in earlier studies they found that potassium is capable of effecting the retroresorption of extravascular water. Potassium seems to promote the movement of fluids from the tissues to the circulatory system without influencing the hemodynamic factors of water metabolism. For this reason its use for patients with heart disease was limited, because adequate circulatory powers are required to carry the fluids that have entered the circulatory system to the kidneys. Potassium has its point of attack on the tissues, the water combining power of which is regulated chiefly by changes in the electric potential. In this report the authors describe attempts to activate the water elimination in obese persons by means of potassium. They used a potassium salt mixture with the high potassium content of 22.81 per cent. In 8 of 13 hydrophilic obese persons the potassium administration increased the diuresis and resulted in a loss of weight. However, this result is not always obtained. It is suggested that to obese persons with a tendency to water retention potassium be given in thrusts so as to counteract the swelling of the hydrophilic tissue. Potassium could be tried also in other disturbances of the peripheral water metabolism. Ascitic processes, except hepatic cirrhosis, might be suitable for the potassium therapy; also thrombosis of the leg with severe swelling of the tissues.

Book Notices

Treatment in General Practice. By Harry Beckman, M.D., Professor of Pharmacology, Marquette University School of Medicine, Milwaukee, Wisconsin. Fourth edition. Cloth. Price, $10. Pp. 1,015. Philadelphia & London: W. B. Saunders Company, 1942.

The book by Beckman continues to grow in size and in circulation. This edition is prefaced by a statement in which Dr. Beckman points out that medical literature grows so rapidly that the task of evaluating new contributions and incorporating them into the text is becoming constantly more difficult. In the present edition many new diseases are included for the first time and there is also much new material. Such diseases as Q fever, schistosome dermatitis, target cell anemia and toxoplasmosis are examples of the necessity that every doctor assiduously endeavor to keep himself up to date. Special qualities of Beckman's book are its rationality and readability. Some of his aphorisms deserve quotation. After mentioning several treatments for glanders, he says " . . . a grave disease, then, for which we have no remedy." The section on malaria is preceded by the famous poem of Ronald Ross. Under the treatment of chronic malaria he says "As I said earlier in this section, there is need for a clear delineation of chronic malaria. (What a fine task for some intelligent young man in the South to set himself to!)." In the section on the therapy of poliomyelitis he says "I have heard it said by an orthopedist who had watched Kenny at work in Minneapolis that in his opinion not everything that met the eye there was to be taken at quite face value; he was nevertheless quite convinced that the therapy of poliomyelitis would be advanced by Kenny's contributions." The section on diabetes is one of the most useful in this volume —well organized and exceedingly practical in its advice on diabetes. Here is a brief quotation from the introduction to the section on disturbances of menstruation:

> There is nothing more fascinating to me in the whole of medical literature than the pretty pictures, especially those in colors, showing how the various anterior pituitary and ovarian hormones may be assumed to regulate the menstrual cycle. But there is no proof in that same literature, nor even any strongly suggestive evidence based upon controlled clinical experimentation, that such regulation can be effected at will by the administration of commercially available preparations of the allegedly specific hormones. . . . I must still advise the reader, as was done in the preceding edition of the book four years ago, to spend his memorizing ability upon something other than the names of the sex hormone products of the competing pharmaceutical houses

Especially valuable also is the chapter on dyspepsia, in which the author quotes extensively from the contribution by Alvarez. Exceedingly apt is the consideration of colitis and constipation under the title "Colon Consciousness."

The book runs the entire gamut of medical conditions, including everything from infection to infestation, all the forms of poisoning and other disturbances. At the end of the book there is a bibliography of some sixty pages indicating the vast literature that has been consulted as a basis. Altogether, Beckman is a most practical guide to current therapy.

The Dynamic State of Body Constituents. By Rudolf Schoenheimer, M.D. Harvard University Monographs in Medicine and Public Health [Number 3]. The Edward K. Dunham Lectures for the Promotion of the Medical Sciences 1941. Cloth. Price, $1.75. Pp. 78, with 6 illustrations. Cambridge: Harvard University Press; London: Oxford University Press, 1942.

The use of isotopes in the study of intermediary metabolism has given a picture of the state of living matter of contrast to the static theories formerly in vogue. The analogy of the combustion engine with its steady flow of fuel into a fixed system has been replaced by the concept that all constituents of living matter, structural or functional, single or complex, are in a steady state of rapid flux. Schoenheimer's pioneering efforts in the use of heavy hydrogen in labeling fatty acid molecules and his brilliant later work on amino acids and the formation of various excretory products are classics in this field. The three lectures in this short monograph were drafted by Dr. Schoenheimer and, after his untimely death, revised and delivered by Dr. Hans T. Clarke. They cannot be considered a review of the entire field of isotopic experimentation. Dr. Schoenheimer's theories are, however, well presented and the book deserves inspection by all those interested in keeping abreast of the rapidly changing field of intermediary metabolism. The details of the methods of synthesis, isolation and analysis employed are not given, the entire discussion being confined to the results obtained and their physiologic application. A picture is given of the constant release and replacement of fragments of large molecules, of complex and interlocking biochemical reactions and the ceaseless interchange of essential radicals. Of particular interest are discussions of the part played by choline and methionine as sources of methyl groups, the participation of arginine in the urea cycle, the role of amino dicarboxylic acids in transamination, the formation of creatine from choline, arginine, aminoacetic acid and methionine via guanidoacetic acid, the nonparticipation of linoleic acid in the interconversions of the other fatty acids, and the discovery that "essential" amino acids may be such because in some cases the amino group, in others the carbon chain, is indispensable. An extensive bibliography, with a series of general references, and a brief index are provided. As a tribute to Dr. Schoenheimer an appreciative biographic sketch by Dr. Clarke is incorporated as a foreword.

The Science of Health. By Florence L. Meredith, B.Sc., M.D., Professor of Hygiene, Tufts College, Medford, Mass. [Second edition of "Twelve Hours of Hygiene."] Cloth. Price, $2.50. Pp. 427, with 138 illustrations. Philadelphia: Blakiston Company, 1942.

This is an excellent textbook on healthful living, intended for use in college courses in hygiene to which one hour a week is devoted for one semester. The author uses many excellent diagrams, graphs and tables. Especially useful in a perplexed world should be the unusually good material in this book on personality adjustment and what would commonly be called mental hygiene. The portions which deal with such controversial subjects as alcohol, tobacco and narcotics are well and conservatively handled. The section on sex and reproduction is adequate. There is a good bibliography, a useful though not extensive list of organizations working for the health of the people (from which the author has intentionally excluded governmental agencies and, for some inexplicable reason, all professional organizations of doctors!), a table of official death rates for the latest year available (1939) and other tabular matter of general use, including two calory tables, one on a weight basis and one in hundred calory portions. The calory table in terms of pounds would have more usefulness in terms of more usual servings. This book, which replaces a previous edition under the title "Twelve Hours of Hygiene," should continue the useful service of its predecessor.

Molecular Films: The Cyclotron & The New Biology. Essays by Hugh Stott Taylor, Ernest O. Lawrence and Irving Langmuir. Cloth. Price, $1.25. Pp. 95, with 36 illustrations. New Brunswick: Rutgers University Press, 1942.

In this volume, three prominent scientists present concepts related to some of the unsolved problems in biology. The book is essentially a plea for greater cooperation among various sciences, particularly since new methods developed in one science may be especially applicable to problems in another. Thus, Dr. Ernest O. Lawrence describes the cyclotron, which has been of immense value in solving problems in biology and in medicine related to etiology in some diseases, the actions of enzymes, physiology and pharmacology. Dr. Irving Langmuir describes the use of the surface film technic for studying proteins, and the history of our approach to new problems with new methods is told by Dr. Hugh Stott Taylor. The Rutgers University Press has produced the book as a beautiful example of modern typography.

Synopsis of Ano-Rectal Diseases. By Louis J. Hirschman, M.D., F.A.C.S., Professor of Proctology, Wayne University, Detroit. Second edition. Fabrikoid. Price, $4.50. Pp. 315, with 194 illustrations. St. Louis: C. V. Mosby Company, 1942.

The considerable experience of the author is reflected in this well established handbook of proctology. Written in a practical fashion, the little volume contains quantities of useful information. There are numerous illustrations, many of which are highly instructive and a number of which are in excellent color. The subject matter is confined to those diseases of the rectum and anus which are within the ken of the occasional rather than the constant practitioner of proctology. Anatomy, anesthesia and symptomatic significance and treat-

ment are first discussed. The author, it must be noted, has his own peculiar concepts of the anus and its diseases. Many of the methods of treatment are his own. There are, of course, a number of differences from standard methods described by others. It might be questioned whether the upper border of the anal canal should be placed at the dentate margin. For surgical purposes the author states that hemorrhoids can be considered as occurring in three distinct masses, and he describes a technic suited only for this. The chapters on pruritus and constipation are a practical commentary on obstinate problems. It is obvious that in most instances the author is speaking with authority and wisdom. The student can gain much from a handbook of this nature, but the general practitioner is likely to refer to it first whenever he desires information pertaining to the subject.

Encephalography. By E. Graeme Robertson, M.D., M.R.C.P., F.R.A.C.P., Physician to Out-Patients, Royal Melbourne Hospital, Melbourne. Monographs from the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne, Number 2. Boards. Pp. 105, with 68 illustrations. Melbourne & London: Macmillan & Company, Limited; New York: G. E. Stechert & Company, 1941.

This is the second of a series of monographs financed by the Walter and Eliza Hall Institute of Research in Pathology and Medicine at Melbourne. The monograph is a lesson in the gross anatomy of the brain, liberally illustrated by line drawings in color of the ventricular system, by photographs of brain sections and, most importantly, by scores of clearly reproduced roentgenograms. For the most part these illustrate case reports. The procedure of encephalography is detailed and well illustrated. The author advocates the introduction of 30 cc. of air, a method saving of air and of patient discomfort but lavish of films. The subarachnoid and subdural spaces receive relatively little attention. The monograph is principally useful as a demonstration of the detailed information which can be derived from the use of small amounts of air, and as an atlas of roentgenograms. Systematic analysis of results receives relatively little attention. The binding is fragile. The author is restrained in his evaluation of electroencephalography. "As experience increases, the number of cases subjected to this procedure diminishes." The monograph can be recommended to all who make use of the roentgen ray for study of the brain.

The Reception of William Beaumont's Discovery in Europe. By Dr. George Rosen. With a foreword by Dr. John F. Fulton. Cloth. Price, $5. Pp. 97. New York: Schuman's, 1942.

An interesting sidelight on William Beaumont's discoveries is this report of how the publication of "Experiments and Observations on the Gastric Juice and the Physiology of Digestion" by William Beaumont in 1834 was received in England, France, Germany and Italy. As is pointed out by Dr. John F. Fulton, on the basis of one well studied case Beaumont was able to change the course of medical thought in gastroenterology. The book is beautifully printed with special paper and bound in boards which reproduce pages of Beaumont's own manuscript. Any collection dealing with gastroenterology ought to possess this contribution to medical history.

Biological Symposia: A Series of Volumes Devoted to Current Symposia in the Field of Biology. Edited by Jaques Cattell. Volume VIII: Levels of Integration in Biological and Social Systems. Edited by Robert Redfield, Professor of Anthropology, University of Chicago. Cloth. Price, $2.50. Pp. 240. Lancaster, Pennsylvania: Jaques Cattell Press, 1942.

The papers in this book were read in a symposium held in connection with the celebration of the fiftieth anniversary of the University of Chicago. They include a series of studies covering the development and sequence of levels of integration, actually tracing the development of the body and the mind from the very lowest forms to the highest and in a way depicting the entire scheme of nature. Not only are individuals concerned but also societies as they exist among insect populations and mammals. The story is told from the coordination of single cells in establishing many celled organisms to the coordination of individuals into complex societies. In this connection the work of Dr. Robert E. Park shows that modern societies are far more free than primitive societies. In his concluding paper on "Modern Society" Dr. Park points out that "the fact that men will still make war for a way of life indicates that the development of integration is for human societies unfinished and implies that integration on a moral level is still of great importance and may become greater again."

The Electron Microscope. By E. F. Burton, Head of the Department of Physics, University of Toronto, Toronto, and W. H. Kohl, Development Engineer, Rogers Radio Tubes Limited, Toronto. Cloth. Price, $3.85. Pp. 233, with illustrations. 110 Drawings by Dorothy Stone. New York: Reinhold Publishing Corporation, 1942.

The interest of the physician in this book depends primarily on the usefulness of this device for the study of viruses, bacteriophage and tissues. Obviously the electron microscope is a tool of research and not of clinical practice. Those physicians who wish to keep abreast of scientific advances in general, however, will find this a practical work. Especially enlightening are the introductory chapters on vision, light and similar basic subjects. The virus of influenza, as determined by the use of the electron microscope, is 12/1,000,000 centimeter. A red blood cell is 4/1,000 centimeter. Obviously the electron miscroscope will find for us materials not previously determinable. The illustration showing the pneumococcus enlarged 67,000 times reveals much that is important in relation to our studies of such organisms.

The National Nutrition. By Morris Fishbein, M.D., Editor of The Journal of the American Medical Association. Cloth. Price, $1.75. Pp. 192. Indianapolis & New York: Bobbs-Merrill Company, 1942.

In this volume the author has collected a number of essays on nutrition published from time to time in such periodicals as *Hygeia*, the *Saturday Evening Post*, the *Red Book Magazine* and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. The material has been rewritten and brought up to date with special reference to the new campaign for improvement in national nutrition and to the special problems related to the war. The chapters include:

What Is National Nutrition?
Hollow Hunger and Hidden Hunger.
Essential Food Materials.
Commonsense and the Family Food.
Review of Vitamin Facts and Follies.
Commonsense and Your Weight.
Meat Eating vs. Vegetarianism.
The Hygiene of Food.
Food and the War.

The book is supplemented with tables covering essentials of a well balanced diet, food requirements that must be kept in mind in nutrition for the national defense.

Report of the Committee on Bed-Bug Infestation, 1935-1940. Medical Research Council, Special Report Series No. 245. Paper. Price, 1s. Pp. 64, with 9 illustrations. London: His Majesty's Stationery Office, 1942.

Since a previous report on the bedbug was published by the Ministry of Health in 1934, much investigation and research have been instituted, a report of which is presented in this pamphlet. The influence of temperature on the breeding, feeding habits and longevity of the pest is given in detail. Many insecticides and ovicides were investigated, those recommended as most useful being heavy naphtha and hydrogen cyanide. Specific instructions for the use of each are given. A chapter is devoted to the construction of buildings so that they give a minimum harborage to bedbugs, and in an appendix the problem of bedbugs in air raid shelters is discussed. There is an extensive bibliography.

First Official List of Motion Pictures on Food and Nutrition. Compiled by Technical Committee on Evaluation of Motion Pictures, New York City Nutrition Program. Paper. Price, 15 cents. Pp. 19. New York, 1942.

The Motion Picture Committee of the New York City Nutrition Program, with the assistance of the American Film Center, reviewed thirty-seven films on food and nutrition. The factors considered in the evaluation of the films were accuracy of subject matter, organization of material, quality of film presentation and educational value. Eleven films fulfilled all the conditions and are "recommended," while four other films, which did not meet all the standards but were still considered useful, are marked "accepted." These fifteen films are listed, with brief notes about the producer, distributor, rating, type of audience, the use, content and appraisal. The list is intended for distribution in New York City but is serviceable elsewhere.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PATHWAYS FOR PAIN AROUND LARYNX FROM INFECTED TOOTH

To the Editor:—A man aged 45 complained of pain over the region of the thyroid and cricoid cartilages on the left side and the midline. This pain could be intensified by pressure to these regions and was not located in the skin covering these areas. The superior laryngeal nerve was not tender and could be excluded. The patient had a thorough local and general examination, which showed no pathologic condition. Two weeks afterward he noticed a swelling in the region of the left lower teeth which revealed an infected molar. After extraction of the teeth the pain in the laryngeal area disappeared completely. I explained the pain as being on the basis of a Head's zone. This author has described such laryngeal zones from lower molar disease. The lower teeth are supplied by the fifth nerve, and it seems reasonable to establish a neurologic connection between the fifth nerve and the area of the laryngeal cartilages, probably on the basis of a so-called false interpretation of pain by the pain centers in the brain. I should like to know which nerve area of the larynx was irritated in this case—in other words, since the cartilages were tender to touch, what is the sensory innervation of the thyroid and cricoid cartilages or their perichondrium and what would be the approximate neurologic pathway of pain in this case? I found nothing in the standard anatomic textbooks concerning this question. M.D., New York.

ANSWER.—The sensory impulses from the larynx are carried to the brain by way of the superior and inferior laryngeal nerves and probably also by sympathetic fibers. The superior laryngeal nerve innervates the larynx down to the lower rim of the vocal folds, the lower portion of the larynx. The tracheal mucosa is innervated for the most part by branches of the inferior laryngeal nerve. There are no known sensory anatomic connections between the vagus or its two ganglions and the trigeminal nerve, although in the medulla oblongata the fibers leaving the sensory and motor nuclei of the vagus surround and pass close to the substantia gelatinosa and the spinal trigeminal tract. All the lower teeth and part of the mandibula are innervated by branches of the mandibular division of the fifth cranial nerve. The skin, however, over the angle of the jaw and the inferior lateral surface of the mandibula is innervated by sensory branches of the great auricular nerve, as are parts of the outer ear, while the external acoustic meatus is supplied by branches of the vagus. Thus it could be possible that in case of a lower molar abscess branches of the great auricular nerve would be irritated and transmit impulses by way of the second cervical nerve, which also supplies the anterior and lateral region of the neck with sensory fibers (cutaneous cervical nerve).

Furthermore, it seems more logical that in this case the local abscess produced a lymphangitis and a possible lymphadenitis and stasis in the lymph circulation. The superior deep cervical nodes drain the face as well as the deeper structures of the head and neck and laterally lie close to the thyroid cartilage. Any disturbance or inflammation of the lymphatic pathways causes local pressure, which may be the cause of localized pain and may subside as soon as the focal source of infection is removed.

NOCTURNAL ERECTIONS IN MAN OF 57

To the Editor:—A man aged 57 had a bilateral vasectomy four years ago following severe prostatitis and seminal vesiculitis. He has no retention or pus cells in the urine at this time but has frequent nocturnal erections. Could this be due to an increase of testicular hormone, especially androgen following vasectomy? M.D., Missouri.

ANSWER.—The symptoms the patient complains of may be due to various causes, and often the etiologic factors are uncertain. Chronic prostatitis and seminal vesiculitis apparently are contributing factors in many cases. The usual treatment, consisting of vigorous prostatic massage, deep instillations of silver preparations and occasional dilations, will frequently give relief. Circulatory disturbances involving the penile circulation may be present in some cases. The cerebral centers of control are evidently involved in other cases. Oversecretion of androgens is not a probable factor, nor should it result from vasectomy. However, cases have been reported which have been controlled by giving the patient diethylstilbestrol. This substance can be administered orally in capsules, with a dosage of 2 or 3 mg. daily for the first week, after which the dose should be reduced.

RANGE OF GASTRIC ACIDITY

To the Editor:—If one uses a tube to drain the contents of a stomach and then gives a histaminelike injection of histamine, what are considered the normal acids of fifteen minute intervals? I have been using the regular old Ewald test meal. Clifton F. West, M.D., Kinston, N. C.

ANSWER.—Various studies of the histamine stimulated gastric secretion in man have indicated a wide range in gastric acidity. Bloomfield and Polland obtained volumes of from 15 to 60 cc. in a ten minute period; the highest total acidity ranged from 60 to 150 clinical units in 90 per cent of a series of normal patients. Ruffin and Dick observed a variation in the level of maximum free hydrochloric acid of from 30 to 85 clinical units in a large group of normal persons.

Palmer has noted similarly that the ten minute volume varies but at the height of secretion usually approximates 30 cc., and at this time the peak of the free acid curve usually ranges from 100 to 140 clinical units. It is most important to note that all ranges of acid secretion from 0 to 140 or 160 are encountered in normal persons with normal stomach as well as in the presence of disease. Consequently the old terms "normal acidity," "hyperacidity" and "hypoacidity" have no clinical significance.

It should be pointed out also that errors occur in the performance of the histamine test and that care must be taken to make certain that the tube is not in the esophagus or duodenum. There are rare cases of transitory achlorhydria, no free acid being obtained on certain occasions even though the tube is in the stomach and despite the fact that abundant free acid is found at other times.

Histamine proved achlorhydria is invariably and consistently present in pernicious anemia and subacute combined degeneration of the spinal cord and absent in chronic benign peptic ulcer. In all other conditions, including carcinoma, the secretory range is wide.

References:

Bloomfield, A. L., and Polland, W. S.: Gastric Anacidity, New York, Macmillan Company, 1933, p. 32.

Ruffin, J. M., and Dick, Macdonald: The Significance of Gastric Acidity After Histamine Stimulation: A Statistical Study of 2,877 Gastric Analyses, *Ann. Int. Med.* 13:1940 (June) 1939.

Palmer, W. L., in Diseases of the Stomach, Modern Medical Therapy in General Practice, Baltimore, Williams & Wilkins Company, 1940, p. 2230.

POSSIBLE PURPURA

To the Editor:—A retired farmer aged 57, weighing 137 pounds (62 Kg.) and 5 feet 3½ inches (160 cm.) tall, is quite well nourished and appears to be in good health. His chief complaint is of attacks of red blotching discoloration of the skin, which began about four years ago and was then confined to the lower portion of the legs and now involves the entire legs and to above the middle third of thigh. The appearance of red blotches is accompanied by intense itching, which does not yield to any of the ordinary antipruritics. The examination the skin is almost symmetrically involved in both lower extremities up to the middle third of the thigh, and small blotches are present up to the hips. The involved portions are relatively smooth but are slightly elevated above small patches of uninvolved skin. The areas are bright red; where the condition is receding there is a brownish discoloration as from a bruise. It seems that there is an extravasation of blood into the skin and not under the skin, and the slight stretch due to this fluid in the skin seems to cause the itching sensation. Anything that may be suggested relative to this case will be very much appreciated. Fred S. Bronneman, M.D., Hooston, Kan.

ANSWER.—The description given lacks several details that would be helpful in making a tentative diagnosis. The author of the query does not state whether the color of the eruption fades on pressure, as does the color of an inflammation, or persists under pressure, as is the case when the redness is due to a deposit of blood. Mention of the frequency and duration of the attacks would also be of assistance. Acute attacks of a vivid eruption which on fading passes through the changes characteristic of a bruise suggests erythema multiforme. Itching is not a common accompaniment of erythema multiforme but might occur in the form of the disease which has features of urticaria. Purpura is common in this disease; but erythema multiforme confined to the lower extremities in successive attacks over four years would be unusual.

The involvement of the lower extremities progressing slowly upward and the brown left on fading are also somewhat suggestive of acrodermatitis atrophicans, but the latter disease is not characterized by acute attacks, progressing slowly without subjective symptoms.

Assuming that the doctor's observation and reasoning as to the cause of the itching are correct, one must think of the wide limits of the etiology of the purpuras. Musser and Wintrobe in the the Tice System of Medicine (Hagerstown, Md., W. F. Prior Company, 1933, volume 6, p. 930) present a good outline and R. R. Kracke's article on the Diagnosis and Treatment

of the Purpuric Diseases (*South. M. J.* **36**:56 [Jan.] 1941) will be found of value. Kugelmass (Vitamin P in Vascular Purpura, THE JOURNAL, Aug. 17, 1940, p. 519) offers a method of treatment helpful in certain cases. The same is true of the article of Peck and Rosenthal on the effect of moccasin snake venom in hemorrhagic conditions (*ibid.*, March 30, 1935, p. 1066); and there are many others.

MEASURING BLOOD CIRCULATION

To the Editor:—An outline of the best practical means of determining total blood volume in man is desired. Will you supply this information please?

Carl E. Ridehoover, M.D., Warren, Pa.

ANSWER.—Total blood volume is not measurable in life in man, but the amount in actual circulation can be.

The measurement of the circulating blood volume requires the estimation of the plasma volume and the determination of the hematocrit.

Plasma volume is determined by measuring the dilution of a given amount of dye injected intravenously. Samples of the blood are drawn after sufficient time for mixing of the dye in the blood stream has elapsed and the concentration of the dye in the plasma determined. The degree of dilution of the dye can be considered an index of the circulating plasma volume. Conversion of this figure into circulating blood volume can be affected by use of the formula

$$\text{Circulating Blood Volume} = \frac{\text{Circulating Plasma Volume}}{100 - \text{Hematocrit}}$$

The measurement of the dye concentration in the plasma can be determined by chemical extraction or preferably colorimetrically. Numerous dyes have been used, but most of these have disadvantages such as rapid destruction or elimination of the dye within the period required for mixing, or passage through the capillary walls into the tissue spaces. The development of the dye T-1824, which stays within the vascular system, has reduced these errors to a minimum. The lot of dye must be standardized by measuring the light absorption of various dilutions of the dye in plasma. In this way a reference chart may be prepared with which the plasma samples to be measured may be directly compared.

A number of instruments are on the market which will measure the light transmitted by a sample. The simple colorimeter is usually not sufficiently accurate, since it does not discriminate the color of the dye adequately from other colors, thus introducing errors. The spectrophotometer is an instrument which can be set at a particular wavelength and the absorption at this wavelength measured, but handling of this machine requires special technics and it is not available in most clinical laboratories. The photoelectric colorimeter has been adapted for use in plasma volume determinations by the use of a filter which allows light with wavelengths in the region of 620 millimicrons to pass. A microattachment is also available which enables the worker to use small quantities of plasma.

Further details of this method may be found in the following articles:

Gibson, J. G., 2d., and Evelyn, K. A.: Clinical Studies of the Blood Volume, *J. Clin. Investigation* **17**:153 (March) 1938.
Gregersen, M. I., and Stewart, J. D.: Simultaneous Determination of the Plasma Volume with T-1824 and the "Available Fluid" Volume with Sodium Thiocyanate, *Am. J. Physiol.* **125**:142 (Jan.) 1939.

DERMATITIS OF SCALP AND PERMANENT WAVE SOLUTIONS

To the Editor:—A woman aged 33 stated that she had pruritus of the scalp with subsequent loss of hair and an erythematous macular rash involving the scalp, face and trunk. Her temperature rose to 102 F. and there were orthostatics. The work-up revealed a mild secondary anemia and a leukopenia of 4,000 with a normal differential count. Her symptoms persist, and it is felt that a compound applied to the hair and scalp prior to the application of the waving machine may be responsible for her illness. Would you be good enough to inform me of the possible agents which may be so used and which may cause such a syndrome to occur?

Herman L. Jacobius, M.D., New York.

ANSWER.—Before a permanent wave is given, the hair is softened by the use of a solution containing an alkali, usually ammonia, potassium carbonate or borax. The solution also contains a gum which helps to stiffen the curls and make them last longer. Tragacanth, acacia, psyllium seed, karaya gum or chondrus are commonly used for this purpose. These are the ingredients most likely to cause sensitization of the skin and dermatitis. Of these, karaya gum has been found the most frequent offender.

The proper procedure would be to obtain from the hairdresser a small amount of the lotion used in the case described and, when the skin eruption has cleared sufficiently to make it safe, to make a patch test with the lotion, using a single drop on a minute piece of cotton or gauze, covered by a square of cellophane and fastened with adhesive tape. In a case in which there is a possibility of sensitization to gums it might be wise to try the skin with adhesive tape alone at first, because the gums used in its manufacture may give a reaction. If a positive patch test is obtained with the hair lotion, the manufacturer should be asked to furnish samples of the ingredients used in making it and these should be used for patch tests to determine just what is responsible.

References:

Oliver, E. A.: Contact Dermatitis, *M. Clin. North America* **26**:13 (Jan.) 1942.
Salzberger, M. B.: Dermatologic Therapy in General Practice, Chicago, Year Book Publishers, Inc., 1942.

HYDROCHLORIC ACID ADMINISTRATION AND ULCER

To the Editor:—When a person of middle age with achlorhydria takes a teaspoon of diluted hydrochloric acid with each meal, is there any danger of bringing on oneself a gastric or duodenal ulcer because of the excessive intake of the acid? Is it safe to continue it for months or years?

M.D., Philadelphia.

ANSWER.—It has been shown by Shay and Gershon-Cohen that 5 cc. of diluted acid given with an Ewald meal to persons with achlorhydria produces little or no free acid in the gastric juice when tested with Töpfer's reagent. Schiffrin and Ivy state that ulceration in the gastrointestinal tract has never been produced in experimental animals by physiologic concentration of acid in the absence of pepsin. A review of the literature fails to reveal any report of the production of gastric or duodenal ulcer by the therapeutic administration of diluted hydrochloric acid. In view of this evidence it can be asserted that diluted hydrochloric acid in the ordinary therapeutic doses given at each meal may be taken for months and even years without fear of producing ulceration in the gastrointestinal tract. It is advisable, however, to protect the teeth by using a glass drinking straw and by mildly alkaline mouth washes.

References:

Shiffrin, M. J., and Ivy, A. C.: Physiology of Gastric Secretion, *Arch. Surg.* **44**:399 (March) 1942.
Shay, Harry, and Gershon-Cohen, J.: Effectiveness of Glutamic Acid Hydrochloride and Dilute Hydrochloric Acid as the Replacement Therapy in Anacidity, *Ann. Int. Med.* **9**:1628 (June) 1936.

GRID FOR EVALUATING PHYSICAL FITNESS

To the Editor:—Can you give me any information as to the reliability of a grid for evaluating physical fitness by Herman C. Wetzel, M.D.? I have received the instruction manual and grid, together with the reprint from The Journal, March 22, 1941. I shall be glad to have an opinion regarding the reliability of this grid for practical use.

Frank Howard Richardson, M.D., Asheville, N. C.

ANSWER.—To estimate the reliability of a test of this nature it must be given to the same person twice, and the degree of association between the two sets of scores is determined by the computation of the coefficient of correlation. If the test is reliable and the patient has not changed materially between its first and second application, the two sets of scores will be nearly identical. Wetzel's test probably has a high coefficient of reliability because the observational errors of simple measurements of height and weight should be slight, and objective errors, such as variants due to diurnal influences, are relatively small. Wetzel does not calculate the statistical reliability of his test but he does examine into its validity. This was tested by comparing grid scores with two other criteria of physical fitness and nutritive state: (1) clinical appraisal and (2) reduction of data in the published literature to grid scores, comparing these with the original rating distribution. Both tests of validity indicate that the grid evaluates precisely what it purports to measure.

The grid has been copyrighted by the author, and his published description fails to include any reference to the data on which it is based. Since there is a close relationship between height and weight during school life and the functions are strongly linear, strictly random samples of children of both sexes covering the specified age span may be used to establish the slope constant of this curve, which will have known probable errors. Such traits as the height and weight of any population are variable. Since the entire universe cannot be studied, a fraction stands for the whole. That it can do so rests on the laws of probability. Thus the degree of the unreliability of any set of determinations may be measured as well as the scatter of the data.

The grid appears to be a graphic representation of the regression line of the correlation surface between weight and height flanked by a series of "channels" which probably represent

multiples of the standard error of the line. The data given by Wetzel indicate that the observations about each isodevelopmental level line are distributed along a normal probability curve. This means that 68 per cent of the cases fall within $\pm 1\sigma$ and 99.7 per cent within $\pm 3\sigma$. When such a graph is used for critical comparisons, the chances of an individual falling outside $\pm 3\sigma$ is quite small, 1/370. If an individual deviates to such an extent, it is more probable that the cause is some abnormal factor rather than chance. The statistical method is the only practical one for the solution of the problem Wetzel has attacked.

HYPERTROPHY OF THYMUS

To the Editor:—A girl aged 3 months was roentgenographed and I find a widening of the superior portion of the mediastinum. The child has been asymptomatic. Eight weeks ago she developed some cyanosis and some respiratory embarrassment. A roentgenogram at that time showed widening of the mediastinal shadow. She received three radiation treatments, and the check plate that followed showed resolution of the widened superior portion of the mediastinum. This plate, which was just taken, is identical with the original plate taken eight weeks ago. The child is, however, apparently suffering no untoward effects from this recurrence, if that is what the shadow indicates. My questions now are: 1. Is this due to thymic hypertrophy? 2. What should be done regarding further treatment since the reappearance of the shadow with no symptoms? 3. What is the usual course of thymic hypertrophy and what is the prognosis?

Michael H. Parlin, M.D., Hays, Kan.

Answer.—The subject of hypertrophy of the thymus gland in infancy has today reached an impasse between that part of the profession which believes it to be clinically significant and the larger group, members of which believe that an enlarged thymus gland rarely causes symptoms. The latter feel that only in those cases in which the enlarged mediastinal shadow is due to a particularly broad and thickened thymus or to a thymoma are the pressure symptoms relieved by roentgen therapy. To answer the specific inquiries:

1. The respiratory embarrassment and cyanosis were probably not due to the thymic hypertrophy.

2. There does not seem to be any valid reason why the child should be treated further, especially in the absence of symptoms.

3. The enlarged mediastinal shadow gradually decreases in size unless a thymoma is present. The prognosis is good if the symptoms were on the basis of an enlarged thymus.

RADIUM FOR OFFICE PRACTICE OF OTOLARYNGOLOGY

To the Editor:—I am contemplating buying radium enough to do the ordinary work that comes in to my eye, ear, nose and throat office. How much should I get and where would you suggest that I buy this?

Charles E. Gillespie, M.D., Seymour, Ind.

Answer.—The conditions in the eye, ear, nose and throat requiring radium treatment that can be carried out in the office are so few and the use of radium with its attendant dangers is so specialized that it is rarely advisable for a physician to attempt to have his own supply of radium for this purpose. As a rule therapy either with radium or with high voltage roentgen rays should be entrusted to radiologists who have had the special training required for the safe and effective use of this treatment.

Radium may be secured from the Radium Chemical Corporation of America, New York. A total of 50 mg. in ten platinum needles of 5 mg. each should suffice, with a copper tube in which the needles may be placed for use in the nasal passages and with a monel metal box in which the needles may be placed for contact therapy on the skin.

OCCUPATIONAL EXPOSURE TO CITRIC ACID

To the Editor:—Men working in a chemical plant making citric acid have complained of bad teeth. The impression is that the citric acid inhaled in dust form causes deterioration of teeth, softening of enamel and some gingivitis. Is there any specific information on the subject? Would an alkaline mouth wash such as solution of sodium bicarbonate be of benefit?

A. A. Bersin, M.D., Brooklyn.

Answer.—It is difficult to evaluate the effects of occupational exposures without a careful dental record previous to the particular employment. Citric acid being a relatively weak acid is not likely to cause decalcification of the enamel of the teeth as do nitric and hydrochloric acid. However, prolonged exposure might eventually cause decalcification. It is more likely that citric acid dust, like other dusts, will produce its harmful effect through irritation of the soft tissues and abnormal wear of the hard tissues by physical rather than chemical action. The harmful effects can be better prevented by the wearing of masks rather than by the use of alkaline mouth washes.

TIC DOULOUREUX

To the Editor:—In the *Journal of the American Dental Association* (27: 587 [April] 1940) I saw an article by T. A. Hardgrove, D.D.S., entitled "Tic Douloureux: Etiology, Accurate Diagnosis and Treatment by the Use of Typhoid Vaccine." I should like to know what the opinion of the medical profession in general is as to the efficacy of this treatment, and, if it is being used at the present time, I should appreciate an outline of the procedure in carrying out the treatment.

R. H. Hackler, M.D., Washington, N. C.

Answer.—It is hardly believable to find in today's medical literature an article as the one entitled "Tic Douloureux: Etiology, Accurate Diagnosis and Treatment by the Use of Typhoid Vaccine." The article reveals ignorance of neurology, of the symptomatology of trigeminal neuralgia and of its voluminous literature. The etiology and pathology of this disease are yet unknown to the neurologist and neuropathologist. To call it but an aftermath of typhoid invasion or infection is just as ridiculous as to call it a complication of syphilis or of a respiratory infection. In reviewing the last 50 cases in a series of over 400 cases of major trigeminal neuralgia only 2 patients had a history of typhoid, 1 thirty years and the other forty-one years before the onset of the neuralgia. But a great number of the patients had all their teeth extracted by dental surgeons who did not recognize trigeminal neuralgia. The author, however, writes that its "cause never lies in the teeth, and the fact that typhoid is a systemic invasion or infection explains why this is true." He reports 11 cases treated by immunization with typhoid vaccine over a period of a year or fifteen months and claims to have obtained complete relief of pain and later of the "tic or jerk"!

There is only one permanent treatment actually known for true trigeminal neuralgia, and that is the section of the pain carrying fibers, preferably central to the gasserian ganglion.

BASLE NOMINA ANATOMICA

To the Editor:—Could you furnish any information about any publications giving the modifications of the Basle Nomina Anatomica as adopted by the Convention of the Anatomical Society of Great Britain and Ireland at Birmingham in 1933? I have a copy of F. Kopsch, Nomina Anatomica, giving the June modifications of the BNA, of 1910 and 1935. I also have a late edition of Gray and Cunningham (seventh edition, 1937) which gives some but not all the names of the Birmingham revision.

M.D., New York.

Answer.—The British "Revision" of the Basle Nomina Anatomica as approved by the Anatomical Society of Great Britain and Ireland is rather a new nomenclature than a revision. It was printed for the Anatomical Society by Robert Maclehose & Co. at the University Press, Glasgow, in 1933. It was not widely distributed and it is doubtful whether any copies can be bought in the United States. It can doubtless be purchased from the Glasgow University Press.

The Glossary of Cunningham's Anatomy, Seventh Edition, 1937, states that terms altered or added in the British Revision of the BNA are listed in the first of their four columns. Presumably this is a complete list of such alterations. (It runs through thirty pages, and the preface indicates that it is complete for alterations.)

PLASMA TRANSFUSION NOT INDICATED FOR DIABETIC ACIDOSIS

To the Editor:—Has plasma proved of value in the treatment of circulatory failure accompanying diabetic acidosis?

M.D., Virginia.

Answer.—The circulatory failure accompanying diabetic acidosis seems to be due to dehydration and loss of electrolytes. The primary need in diabetic coma is for insulin in sufficient amounts. The second essential is the use of isotonic solution of sodium chloride in adequate quantities. Concentration of the blood is characteristic of diabetic acidosis rather than loss of blood or loss of plasma protein. Therefore, replacement of water and electrolytes is needed and not plasma. Where there is reason to believe that loss of blood protein has occurred either by transudation into the tissues, by hemorrhage or by reason of some toxic complication, there would exist special indication for the use of blood plasma. Since patients with diabetic coma frequently prove to have some infectious complication, it is well to bear in mind the possible advantage of transfusion with plasma or whole blood under such conditions. It is true that frequently in diabetic coma blood is found in the stomach, but it is seldom excessive. Its presence has been thought due to diapedesis from stretching of the walls of the stomach. If this transudate of blood occurred in the entire alimentary tract as in the stomach, then the occasion for use of plasma blood would be present, but apparently so far this has not been noted.